



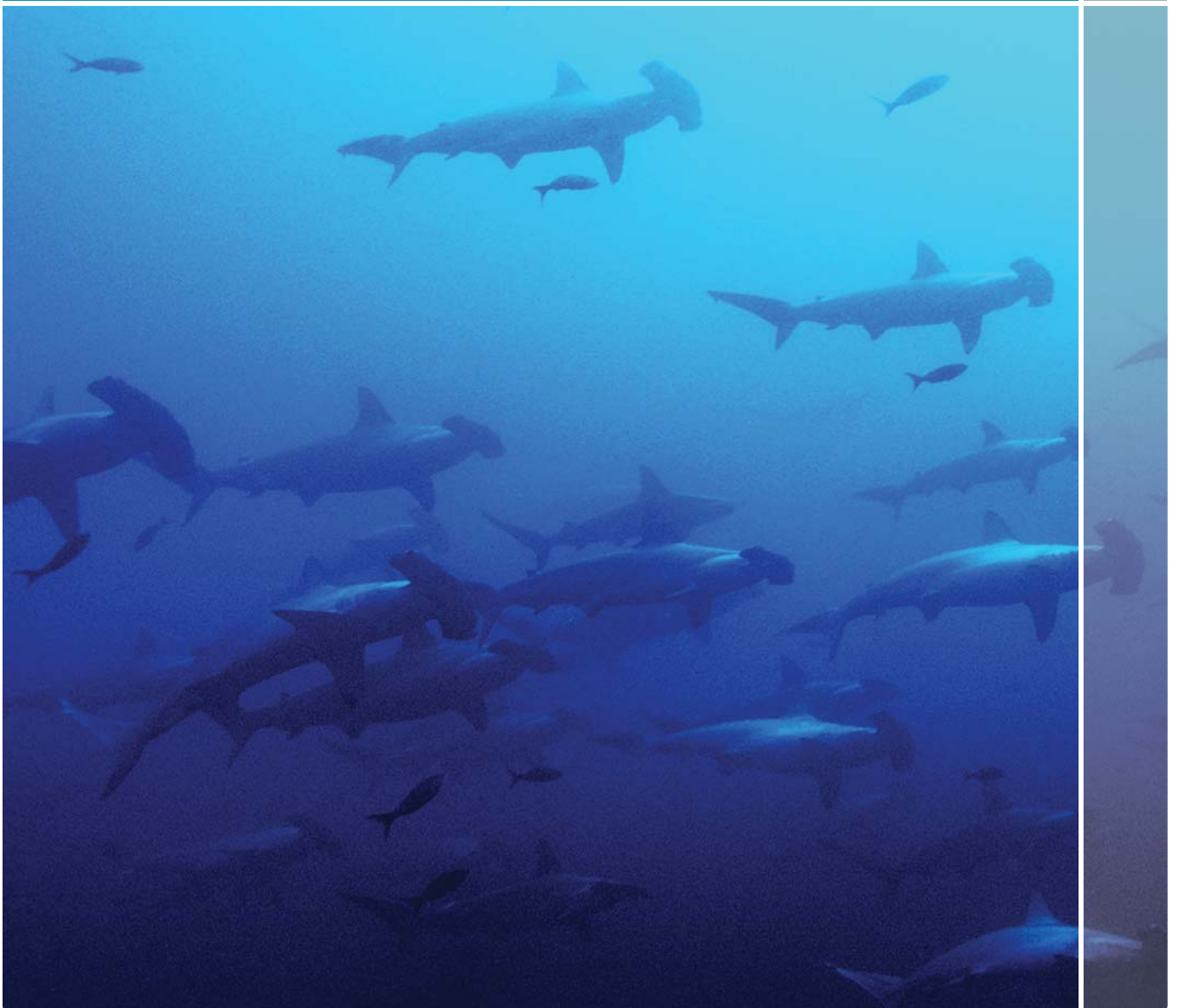
Ministry of  
**Fisheries**  
Te Tautiaki i nga tini a Tangaroa

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New Zealand Government

# New Zealand National Plan of Action for the Conservation and Management of Sharks

October 2008



## FOREWORD

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Sharks have been unfairly characterised as callous hunters. In reality it is the sharks that are hunted, both commercially and recreationally, and many of the world's shark stocks are at risk from over-fishing. We now know that sharks play an important role in maintaining a healthy ocean ecosystem.

The New Zealand EEZ is home to over 100 species of shark. New Zealand has a global responsibility to manage and conserve our shark species. The Ministry of Fisheries has produced this National Plan of Action for Sharks to address this responsibility consistent with the United Nations Food and Agriculture Organisations International Plan of Action for Sharks (IPOA – Sharks).

The overarching goal of the IPOA-Sharks is:

*'to ensure the conservation and management of sharks and their long-term sustainable use'*

New Zealand's National Plan of Action for Sharks will ensure that measures are in place to enable this internationally-accepted goal for shark stocks to be met.

New Zealand has a world class fisheries management system that applies equally to sharks as it does to other fish species. The NPOA-Sharks recognises that sharks are particularly vulnerable to over-fishing, and the actions described in the Plan will strengthen measures to conserve and manage our shark species. The challenge for all involved in New Zealand fisheries is to work together to ensure we achieve all our goals for shark stock management.

In producing a National Plan of Action for Sharks we are giving our absolute commitment to achieving shark conservation and sustainable use.



**HON. JIM ANDERTON**

Minister of Fisheries  
October 2008

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## EXECUTIVE SUMMARY

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- 1 Sharks share a number of biological characteristics that make them susceptible to over-utilisation. To address global concerns about the management of sharks, the Food and Agriculture Organisation of the United Nations (FAO) organised experts to consult on an International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks). The overarching goal of the IPOA-Sharks is ‘to ensure the conservation and management of sharks and their long-term sustainable use.’
- 2 To achieve this goal the IPOA-Sharks suggests that member states of the FAO that conduct fisheries that either target sharks, or regularly take sharks as incidental catch, should develop a National Plan of Action for the Conservation and Management of Sharks (NPOA-Sharks). Approximately 112 species of sharks have been recorded from New Zealand fisheries waters, of which in excess of 70 are taken by fishers. As a member state of the FAO, there is an onus on New Zealand to develop an NPOA-Sharks.
- 3 The IPOA-Sharks identifies management principles at a strategic level and proposes a suite of generic operational objectives for an NPOA-Sharks. The challenge for New Zealand is to ensure that management strategies for sharks are in place that provide a sufficiently high probability of achieving these internationally-accepted goals for shark stocks.
- 4 New Zealand has established a comprehensive fisheries management system for managing extractive fisheries and for protecting threatened and endangered marine species from the effects of fishing. This system applies equally to shark species as it does to other forms of aquatic life. The NPOA-Sharks describes New Zealand’s fisheries management system as it applies to shark species. The system described is largely in operation now although there are several measures that are in varying stages of implementation.
- 5 The NPOA-Sharks also examines the alignment of New Zealand’s fisheries management system, as it applies to the management of shark species, with the goals, principles and management objectives contained in the IPOA-Sharks. New Zealand’s fisheries management system is closely aligned with the IPOA-Sharks.
- 6 There remain, however, several areas that need to be addressed. A range of actions will be implemented to ensure that fisheries management in New Zealand satisfies the objectives of the IPOA-Sharks to ensure the conservation and management of sharks and their long-term sustainable use.
- 7 Actions consist of the following;

### Actions to eliminate live shark finning:

- i) *Ensure fishers are aware that live finning of sharks constitutes ill-treatment and is an offence under the Animal Welfare Act*

The Ministry of Fisheries will ensure that the cruelty aspect of live finning is articulated clearly to fishers operating in fisheries where shark finning takes place.

Due: Ongoing

*ii) Establish reporting protocol to enforce the Animal Welfare Act*

A reporting protocol will be established to ensure that any observed instances of live finning are reported to the Ministry of Agriculture and Forestry (MAF).

Actions to ensure appropriate management of threatened and endangered species

*iii) Protect Basking Shark*

As basking shark is listed on Appendix 1 of CMS, New Zealand has an obligation to provide protection for this species in New Zealand waters and from New Zealand vessels fishing on the High Seas.

Due: 2009

*iv) Develop and implement a prohibited utilisation process standard*

The standard will be used to identify marine species where no level of utilisation is considered to be sustainable.

Due: 2011

Actions to review shark management

*v) Review Schedule Six provisions in relation to spiny dogfish*

The Ministry of Fisheries will review the Schedule six provisions currently in place for spiny dogfish to ensure that they are appropriate.

Due: 2010

*vi) Review listing other shark species, or specific life stages of other shark species, on Schedule Six*

The Ministry of Fisheries will review the use of Schedule six provisions to allow the live release of additional shark species, or specific life stages of other shark species.

Due: 2012

*vii) Review and revision of NPOA*

A full review and revision of the NPOA-Sharks will be undertaken.

Due: 2012

Actions to improve information

*viii) Strengthen existing research and monitoring programme*

The strengthened programme will address:

- stock status and sustainable yields for exploited shark stocks
- effectiveness of conversion factors in achieving accurate greenweight;
- monitoring of wastage in shark fisheries;
- assessment of measures to promote improved utilisation;

- identification of areas of habitat of particular significance to shark species (e.g. spawning, pupping and nursery grounds); and
- review research and monitoring outputs to assess the effectiveness of shark management.

Due: Ongoing and fully reviewed in 2012

*ix) Reduce use of generic shark reporting codes*

Reduce the percentage of the total commercial shark catch recorded against generic codes to below 1%.

Due: 2010-2011 fishing year

*x) Produce a field identification guide*

Production of a draft field identification guide for all QMS and other fish species (including sharks) commonly caught in commercial and non-commercial fisheries.

Due: 2008

Actions to meet international obligations

*xi) Participate in relevant Regional Fisheries Management Organisations (RFMOs) and other relevant international fora*

Actively participate in the management and research of shark species which are managed through RFMOs of which New Zealand is a member; actively participate in other international fora engaged in the conservation and management of sharks; and support initiatives by other organisations/agencies to collect information on the distribution and abundance of shark species.

Due: Ongoing

## INTRODUCTION

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### Purpose

- 8 The purpose of the NPOA-Sharks is to ensure the conservation and management of sharks and their long-term sustainable use.

### Scope

- 9 In the context of the NPOA-Sharks, 'sharks' are defined as all species in the class *Chondrichthyes* and include sharks, skates, rays and chimaeras. Where the term shark is used in the narrower sense this is noted.
- 10 The NPOA-Sharks applies to species that are found within New Zealand's Exclusive Economic Zone (EEZ) and Territorial Sea, migratory species that frequent New Zealand's EEZ and Territorial Sea, and species taken by New Zealand-flagged vessels fishing on the High Seas.
- 11 The NPOA-Sharks is an operational plan. It is a record of both actions already underway and actions to be undertaken to enhance the conservation and management of sharks in New Zealand. The NPOA-Sharks will be fully reviewed and revised in 2012 to ensure on-going effectiveness of New Zealand's efforts to address the conservation and management of shark species.
- 12 The impacts of fishing are likely to constitute the greatest threats to the sustainability of sharks and consequently they form the primary focus of the IPOA-Sharks. The impacts of fishing are also the primary focus of New Zealand's NPOA-Sharks at this time. The NPOA-Sharks will be further developed over time and non-fishing related impacts on sharks, such as pollution, coastal development and land use change, and climate change, will be addressed in later versions.
- 13 The NPOA-Sharks has been developed by the Ministry of Fisheries with input from the Department of Conservation, the Ministry of Agriculture and Forestry, and the Ministry of Foreign Affairs and Trade. The inclusion of non-fishing related impacts in future iterations of the NPOA-Sharks will necessitate input from additional agencies such as the Regional Councils that have responsibility for the development of Regional Coastal Plans.<sup>1</sup>

### Background

- 14 Sharks share a number of biological characteristics that make them susceptible to over-utilisation. Sharks are predators and many are top-level carnivores. As a result their abundance is low compared with species at lower trophic levels. Additional aspects of shark biology that make them susceptible to overfishing include late onset

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<sup>1</sup> Regional Coastal Plans are plans prepared by regional councils and unitary authorities for the coastal marine area of a region. Their purpose is to assist these councils in achieving the sustainable management of their coastal environment.



of maturity; slow growth rates; long life spans and low natural mortality rate; low fecundity; long reproductive cycle; and reproductive strategies such as giving birth to live offspring or laying a small number of eggs.

- 15 To address global concerns about the management of sharks, the Food and Agriculture Organisation of the United Nations (FAO) organised experts to consult on an IPOA-Sharks. The IPOA-Sharks builds upon the FAO *Code of Conduct for Responsible Fisheries* and was endorsed by the FAO Council in June 1999 and subsequently adopted by the November 1999 FAO Conference.

- 16 The overarching goal of the IPOA-Sharks is:

*‘to ensure the conservation and management of sharks and their long-term sustainable use.’*

To achieve this goal the IPOA-Sharks suggests that member states of the FAO that conduct fisheries that either target sharks, or regularly take sharks as incidental catch, should develop an NPOA-Sharks.

- 17 Approximately 112 species of sharks have been recorded from New Zealand fisheries waters, of which in excess of 70 are taken by fishers. As a member state of the FAO, there is an onus on New Zealand to develop an NPOA-Sharks.
- 18 The IPOA-Sharks identifies management principles at a strategic level and proposes a suite of generic operational objectives for an NPOA-Sharks. The challenge for New Zealand is to make sure that management strategies are in place to maximise its ability to achieve these internationally-accepted goals for shark stocks. New Zealand has in place a comprehensive fisheries management system for managing extractive fisheries and for protecting threatened and endangered marine species from the effects of fishing. This system applies equally to shark species as it does to other forms of aquatic life.
- 19 Part 1 of the NPOA-Sharks describes the shark species found in New Zealand waters.
- 20 Part 2 describes how New Zealand currently manages sharks. The fisheries management system described is largely operational although several measures are included that are in varying stages of implementation.
- 21 Part 3 examines the alignment of the way New Zealand manages sharks with the goals, principles and management objectives contained in the IPOA-Sharks.
- 22 Part 4 describes new actions to address those areas where New Zealand is not achieving the goals, principles and management objectives of the IPOA-Sharks.
- 23 The appendices summarise New Zealand’s shark fisheries and the management of these fisheries.

## PART 1 NEW ZEALAND SHARK SPECIES<sup>2</sup>

- 24 The term ‘shark’ in this section is used in the strict sense (i.e. to refer to selachians alone) rather than the broader definition used in other parts of the NPOA-Sharks.
- 25 About 112 species of sharks, rays, skates and chimaeras have been recorded from New Zealand waters, which constitute about nine percent of the total number of shark species recorded worldwide. Of these 14 are chimaeras, 73 are sharks, and 25 are skates and rays. Three of the chimaeras are endemic to New Zealand, and another seven also occur in Australia and/or New Caledonia. The remainder are widely distributed in the Pacific and other oceans. In contrast most sharks recorded from New Zealand waters are widespread species. Of these five are restricted to the western Pacific from Japan to Australia and New Zealand; and six are Southern Ocean species. Thirteen sharks are endemic to New Zealand, and 8 are restricted to Australasia. Endemicity is greatest among the skates and rays, with 18 species recorded only from New Zealand waters. This includes a number of skate species that have yet to be scientifically described. The remaining species are all widely distributed outside Australasia.
- 26 Diversity in New Zealand waters, as elsewhere, is greatest over the continental slope (200-2500 m depth). Only one species of chimaera, the elephantfish (*Callorhynchus milii*), can be considered a coastal species, all other chimaeras normally inhabit the outer continental shelf and slope.
- 27 Among the sharks 15 species inhabit the outer shelf and upper slope, and 33 are only found below the shelf break (c. 200 m depth). Only five species – rig (*Mustelus lenticulatus*), school shark (*Galeorhinus galeus*), carpet shark (*Cephaloscyllium isabellum*), spotted spiny dogfish (*Squalus acanthias*) and the broadnose sevengill (*Notorhynchus cepedianus*) – can be considered primarily shelf or coastal species. The Port Jackson shark (*Heterodontus portusjacksoni*) also falls into this group but has only been recorded once from New Zealand waters.
- 28 In addition there is a group of 11 coastal-pelagic sharks that tend to occur or aggregate seasonally in coastal habitats, either for breeding or feeding, and are found in offshore and oceanic habitats at other times of the year. Sharks in this group generally reach more than 2.5 m maximum length, and include several potentially dangerous species such as the great white shark (also referred to as the white pointer shark) (*Carcharodon carcharias*), tiger shark (*Galeocerdo cuvier*), bronze whaler (*Carcharhinus brachyurus*) and hammerhead (*Sphyrna zygaena*), as well as the plankton-feeding basking shark (*Cetorhinus maximus*).
- 29 Eight shark species are primarily oceanic, most appearing to migrate seasonally to northern New Zealand from the subtropics and tropics during spring and summer. This ecological group includes the shortfin mako (*Isurus oxyrinchus*), porbeagle (*Lamna nasus*) and blue shark (*Prionace glauca*), and less well known species such

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<sup>2</sup> Information provided by C. Duffy and based on a list compiled by M. P. Francis and A. L. Stewart. The Francis and Stewart list was itself based on a world list of chondrichthyans prepared by L. J. V. Compagno and D. A. Didier.

as the oceanic whitetip (*Carcharhinus longimanus*), silky shark (*Carcharhinus falciformis*) and the giant whale shark (*Rhincodon typus*).

- 30 Of the rays: four species are largely restricted to the shelf (two species of stingray (*Dasyatis* spp.), eagle ray (*Myliobatis tenuicaudatus*) and electric ray (*Torpedo fairchildi*)); one extends to well beyond the edge of the shelf and down the continental slope (rough skate (*Dipturus nasuta*)); and three are oceanic (the pelagic stingray (*Pteroplatytrygon violacea*) and two giant plankton-feeding species, the giant manta ray (*Manta birostris*) and the spine-tailed devil ray (*Mobula japonica*)). Of the remaining species, three inhabit the outer shelf and upper continental slope and 14 are found on the continental slope. They include 15 species of skate and two small blind electric rays (*Typhlonarke* spp.).
- 31 New Zealand's shark fauna is summarised by geographic range in Table 1, and by depth range in Table 2.

**Table 1: Numbers of sharks recorded from New Zealand waters by spatial range**

	Sharks	Skates and Rays	Chimaeras
<b>Endemic to NZ waters</b>	13	18	3
<b>Australasian waters</b>	8	-	7
<b>Widespread</b>	52	7	4

**Table 2: Numbers of sharks recorded from New Zealand waters by depth range**

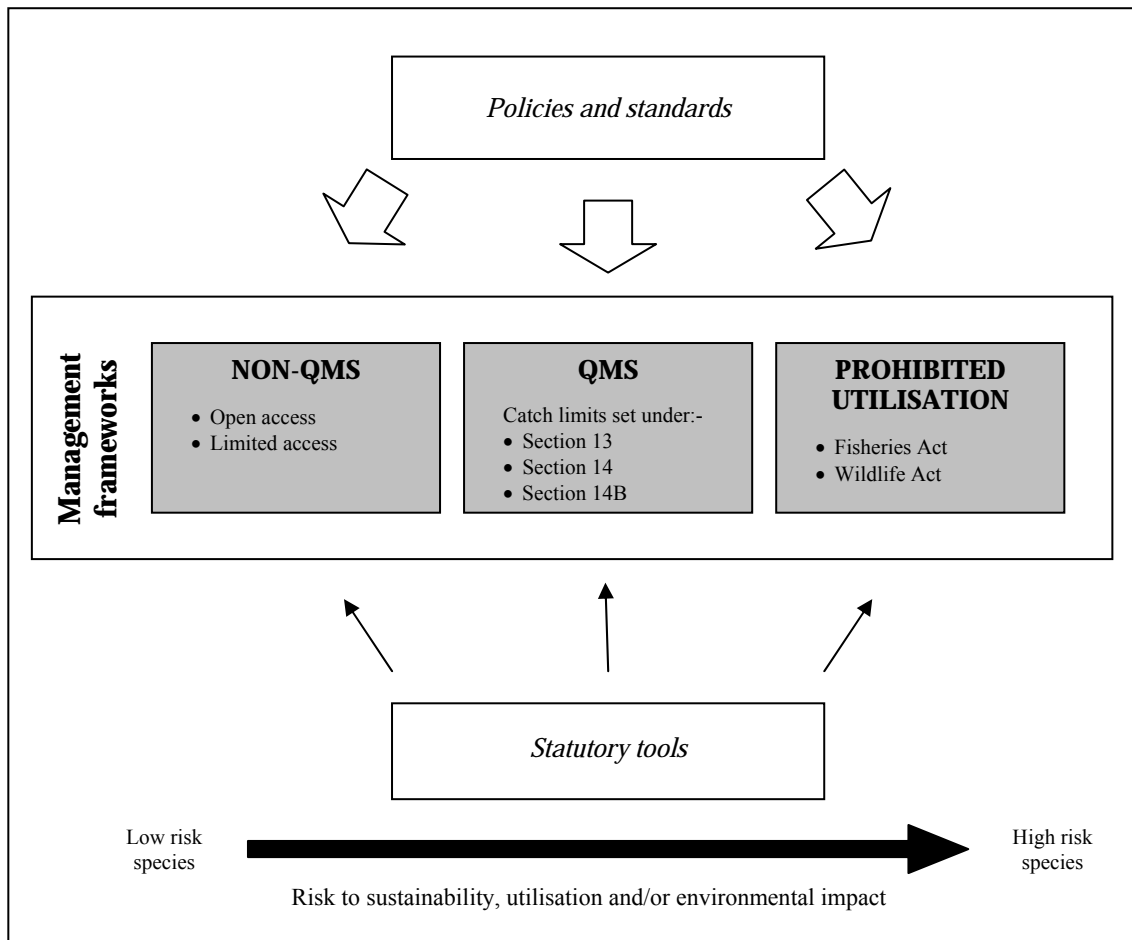
	Sharks	Skates and Rays	Chimaeras
<b>Shelf / coastal pelagic</b>	6	5	1
<b>Outer shelf upper slope</b>	15	3	13
<b>Continental slope</b>	33	14	
<b>Oceanic</b>	8	3	-
<b>Oceanic but seasonally coastal pelagic</b>	11	-	-

## PART 2 SHARK MANAGEMENT IN NEW ZEALAND

- 32 Fisheries in New Zealand, including target shark fisheries and fisheries where sharks are taken as bycatch, are managed under the Fisheries Act 1996 (the Act). Provisions under the Act apply within New Zealand's Territorial Sea, the Exclusive Economic Zone (EEZ), and to New Zealand vessels fishing on the High Seas.
- 33 The purpose of the Act is to provide for utilisation of fisheries resources while ensuring sustainability. In the context of the Act, ensuring sustainability means maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations, and avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment. Utilisation means conserving, using, enhancing and developing a fisheries resource to enable people to provide for their social, economic, and cultural wellbeing. Tools and processes defined under the Act are designed to meet the dual requirements of sustainability and utilisation.
- 34 The Ministry of Fisheries is the government department charged with providing advice to the Government on fisheries management. The goal of the Ministry of Fisheries is to maximise the value New Zealanders obtain through the sustainable use of fisheries resources and protection of the aquatic environment.<sup>3</sup> Policy and management frameworks are designed to achieve this goal.
- 35 It is explicit in the purpose statement of the Act, and in the overarching goal of the Ministry of Fisheries, that fishery resources in New Zealand are to be managed in such a way as to ensure that the benefits of their conservation, use, enhancement and development accrue to all New Zealanders, including both present and future generations.
- 36 Within New Zealand's overarching fisheries management system are three complementary management frameworks:
- a) Managing species where utilisation is prohibited
  - b) Managing species under the Quota Management System (QMS)
  - c) Managing species outside the QMS
- 37 As shown in Figure 1, the three complementary management frameworks are at the heart of New Zealand's fisheries management system. Within each of the three broad management frameworks are a range of more specific management options. Policies and standards will define and support the operation of each of the management frameworks, and also inform decisions as to the most appropriate framework to apply to a given species. There are a range of statutory tools available to ensure that each framework operates effectively to meet the purpose of the Act.

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<sup>3</sup> In this context, 'value' includes commercial profit and economic activity associated with harvest from commercial and amateur sectors such as employment, foreign exchange earnings and retail sales. Value also includes the non-market values held by amateur fishers, customary fishers and environmental groups. These may be associated with the ability to provide food for the table, values for customary practice and tradition and the pleasure of recreational fishing.



**Figure 1. An overview of the New Zealand fisheries management system.**

38 The various components of New Zealand’s fisheries management system are discussed in the following sections.

## 2.1 Management frameworks

39 This section discusses each of the management frameworks in turn and details the key statutory tools available under each framework.

### 2.1.1 Prohibited utilisation management framework

40 Where sustainability concerns dictate limited or no opportunity for extractive use, the taking of a marine species may be prohibited. Such a prohibition is consistent with the goal of the Ministry of Fisheries to maximise value. Non-market values derived from the preservation of rare and endangered species, and the maintenance of biodiversity generally, are maximised by protecting appropriate species.

41 Where a species is threatened, endangered, or otherwise deemed unsuitable for any significant utilisation, taking and possession may be prohibited. Two statutes may be used to prohibit utilisation. These are -

- a) The Wildlife Act 1953 (the Wildlife Act) provides for both full and partial protection of species in New Zealand fisheries waters (including New Zealand's EEZ and Territorial Sea). Protected marine species are specified in Schedule 7A to the Wildlife Act.
  - b) The Fisheries Act provides for the protection of marine species through regulation. Such regulations may apply both to fishers operating within New Zealand fisheries waters, and to New Zealand vessels fishing on the High Seas.
- 42 Both statutes were used to prohibit the take of great white shark from 1 April 2007. This protection applies both within New Zealand's EEZ and Territorial Sea (under the Wildlife Act) and from New Zealand vessels fishing on the High Seas (under the Fisheries Act).
- 43 Both the Fisheries Act and the Wildlife Act provide for significant penalties. Both statutes also recognise that marine species for which utilisation has been prohibited may be taken inadvertently during the course of fishing operations and provide defences for such incidental capture, as long as fishers have returned the animals to the sea and reported the incident to the authorities.
- 44 The key statutory tools that may be used to ensure the conservation of protected shark species include -
- a) General provisions of the Wildlife Act against the taking, possessing and trading in all or parts of protected marine species;
  - b) Population Management Plans under the Wildlife Act;
  - c) Measures under section 15 of the Fisheries Act; and
  - d) Sustainability measures under section 11 of the Fisheries Act.
- 45 These management options and sustainability tools are considered in more detail below.

*Key statutory tools for ensuring the sustainability of species for which utilisation has been prohibited*

Provisions under the Wildlife Act

- 46 The inclusion of a marine species on Schedule 7A of the Wildlife Act means that any person taking, or attempting to take, any animals identified as having absolute protection is committing an offence under the Act. It is also an offence to buy, possess, possess for sale, sell or otherwise dispose of whole animals, or body parts, of these species.
- 47 Under the Wildlife Act a Population Management Plan (PMP) may be developed for protected species. The Minister of Conservation is responsible for the development of PMPs. A PMP can include an assessment of the biology and status of the population, any known fisheries interactions and the degree of risk caused by fishing-related mortality and other human-induced sources of mortality of the species. A maximum allowable level of fishing-related mortality can be specified. The Minister of Conservation can make recommendations to the Minister of

Fisheries on measures to mitigate the fishing-related mortality and the standard of information to be collected.

- 48 No population management plans have been developed for shark species and none are planned at this time.

### Provisions under the Fisheries Act

- 49 Under section 15 of the Fisheries Act the Minister of Fisheries is required to take all reasonable steps to ensure that the maximum allowable fishing related mortality level stipulated in a PMP is not exceeded. The Minister may take additional action that he or she considers necessary to avoid, remedy, or mitigate any adverse effects of fishing on the relevant species. Such action may also be taken, in consultation with the Minister of Conservation, in the absence of a PMP.
- 50 Any of the sustainability measures set under section 11 of the Fisheries Act may be used to reduce a species' fishing-related mortality. The range of measures available under section 11 is discussed in more detail below in relation to the QMS and non-QMS management frameworks.

#### ***2.1.2 QMS management framework***

- 51 The QMS is the preferred management framework for stocks that exhibit sustainability or utilisation concerns, but for which there remains an opportunity for extractive use. This applies equally to sharks as it does to other fish species.
- 52 The primary management mechanism under the QMS is the setting of a total allowable catch (TAC). The TAC includes allowances for non-commercial take and other sources of fishing related mortality, and a total allowable commercial catch (TACC). The TACC is allocated to commercial fishers by means of an individual transferable quota system. Quota is a right which allows people to own a share of the commercial catch for a particular species in a defined area. Quota is owned in perpetuity and can be bought or sold. Each year quota is used to generate an annual catch entitlement (ACE)<sup>4</sup> for its owner based on the TACC allowed for that particular stock. The QMS creates an incentive for sustainable fishing as the value of quota is, in part, influenced by the sustainability of the stock to which it relates. For example the healthier the stock, the higher the catch limit, and the greater the ACE generated by a person's quota holding.
- 53 Eleven species of shark, which account for between 84 and 89% by weight of sharks reported to have been landed commercially over the last five fishing years, are now managed under the QMS (see Appendix 2 for details). Of these species, target fisheries for rig, school shark and elephantfish have all of been managed under the QMS since 1986, and catches have been sustained for 20 years.
- 54 The TAC for each species managed under the QMS is set by the government and amended if required as new information comes to hand. The TAC must be set at a

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<sup>4</sup> At the start of each fishing year quota holdings for a given QMS stock are used to generate annual catch entitlements (ACE) by dividing the TACC by the number of quota shares held. ACE is freely tradable and may be purchased either before or after fish are caught.

level that ensures the sustainability of the stock. The Act includes three options under which a TAC may be set –

- a) Section 13;
- b) Section 14; and
- c) Section 14B

55 In addition to setting TACs, there are a range of additional tools within the QMS that may be used to ensure the sustainability of stocks. Key tools of importance to the sustainability of shark stocks include –

- a) Sustainability measures under section 11
- b) Inclusion of the species on the Sixth Schedule; and
- c) Commercial catch balancing

56 The options for setting TACs and associated sustainability tools are considered in more detail below.

### *Options under the QMS for setting TACs*

#### Section 13

57 Of the eleven species of sharks currently managed under the QMS, eight have their TACs set pursuant to section 13 of the Act (see Appendix 3 for details).

58 Section 13 represents the default management option that is applied when setting a TAC for a stock within the QMS. Under section 13 there is a requirement to maintain the biomass of a fish-stock at, or above, a level that can produce the maximum sustainable yield (MSY), having regard to the interdependence of stocks. MSY is defined, in relation to any fish-stock, as being the greatest yield that can be achieved over time while maintaining the stock's productive capacity, having regard to the stock's population dynamics and any environmental factors that influence the stock.

59 The obligation to have regard to the interdependence of stocks when setting a TAC requires consideration of the effects of fishing on associated stocks harvested with the target stock, and the role of the target stock in the food chain. This provision may be particularly relevant to shark species as they are, in many instances, top level predators and are frequently taken as a by-catch of other species managed under the QMS. By-catch of shark species may be managed under any of the TAC setting options.

60 If a stock is currently below the target stock level, section 13(2)(b) requires that a TAC be set that will result in the stock being restored to the target stock level (i.e. at or above a biomass that will support MSY) in a way and rate which has regard to the interdependence of stocks and within a period appropriate to the stock. Before determining the period within which the target stock level is achieved, the Minister is to have regard to biological characteristics (including longevity and productivity) and environmental conditions (such as the effect of temperature on stock recruitment) affecting the stock.



- 61 If a stock is above the target level, there is a requirement to set a TAC that will result in the stock moving towards the target stock level, or alternatively remain above the target stock level, having regard to the interdependence of stocks (section 13(2)(c)).
- 62 Section 13(3) makes it explicit that for both a rebuild and a ‘fishing down’ of a stock, social, cultural and economic factors are relevant considerations in the determination of the way and rate of progress to the target level, rather than in the determination of the target stock level itself. There is no set rate, or time frame, within which a rebuild or ‘fishing down’ of a stock must be achieved. However the progress of moving towards the target stock level must be suitable to the fishery in question.

### Adaptive Management Framework

- 63 The Adaptive Management Framework was developed as a basis for varying the TACs of fishstocks managed under section 13 for which there was limited information on stock size. The framework was developed to ensure that in taking decisions where information was limited, the Minister of Fisheries did not breach his/her statutory obligations to ensure stock sustainability, while also providing additional monitoring and analyses to improve the assessment of stock status and estimates of sustainable yield.
- 64 The adaptive management framework will ultimately be replaced by fisheries plans and no new AMPs will be approved.
- 65 Stocks of school shark (SCH 3, 5, 7 and 8), elephant fish (ELE 3, 5) and rig (SPO 3) are currently managed under the adaptive management framework.

### Section 14

- 66 Section 14 prescribes an exception to setting the target stock level based on an assessment of the MSY for those stocks where one of a suite of criteria applies. Those relevant to sharks are where:
- a) it is not possible to estimate MSY because of the biological characteristics of the species; or
  - b) a catch limit for New Zealand has been determined as part of an international agreement; or
  - c) the stock comprises one or more highly migratory species.
- 67 Stocks that meet one of the above criteria are listed on the Third Schedule to the Act. For these Third Schedule stocks, a TAC may be set other than in accordance with the requirements stated in section 13, provided the TAC better achieves the purpose of the Act.
- 68 While any TAC must be set in a way that ensures use of the stock is sustainable, under section 14 there is no requirement to take into account or be guided by the need to manage in accordance with MSY. In contrast to section 13, section 14 provides significant flexibility as to the target level set for a stock.

- 69 Three highly migratory shark species (blue, mako and porbeagle sharks) are managed under section 14 (see Appendix 2 for details). For these species TACs have been set for that part of the stock found in New Zealand fisheries waters.

### Sections 14A and 14B

- 70 A further exception to setting a TAC in accordance with the MSY is the management of a stock under s 14B of the Act. Under s 14B, a TAC is set at a level that allows a stock to be managed below the level that can support MSY in order not to constrain the taking of another stock. The stock managed under s 14B must however be maintained at a level that ensures its long term viability.
- 71 Additional requirements for a stock to be suitable for management under section 14B are detailed in section 14A. These include measures to ensure that information is sufficient to assess the impact of management action, that quota owners holding at least 95% of the quota for the stock must support the management under section 14B, the concerns of any dissenting quota owner(s) must be acknowledged and addressed, and that management under section 14B will have no detrimental effects on non-commercial fishing interests in the stock.
- 72 Section 14B has not been used to manage shark stocks and is unlikely to be used for the management of shark species in the future.

### *Key statutory tools for ensuring the sustainability of QMS species*

#### Section 11 sustainability measures

- 73 Sustainability measures set under section 11 of the Act may apply to QMS, non-QMS and stocks where utilisation is prohibited. Such measures relevant to QMS stocks may relate to catch limits (i.e. the TAC), size limits, biological state, fishing seasons, method restrictions and closed areas and may be set by the Minister of Fisheries at any time.
- 74 Sustainability measures currently in place for sharks relate to amateur bag limits and both amateur and commercial set net mesh size. The following amateur bag limits have been established for shark species;
- the Fisheries (South-East Area Amateur Fishing) Regulations 1986, and the Fisheries (Southland and Sub-Antarctic Areas Amateur Fishing) Regulations 1991, set amateur bag limits for rig (5), elephant fish (5), school shark (5), blue shark (1), mako shark (1), porbeagle shark (1), skates and rays (5), and spiny dogfish (15);
  - the Fisheries (Challenger Area Amateur Fishing) Regulations 1986, and the Fisheries (Central Area Amateur Fishing) Regulations 1986, there set a combined daily amateur bag limit for rig, elephant fish and school shark of 20;
  - the Fisheries (Auckland and Kermadec Areas Amateur Fishing) Regulations 1986, rig, elephant fish and school shark are included in the combined daily bag limit of 20.

- 75 The following minimum set net mesh sizes have been established by regulation for shark species;
- In the Auckland and Kermadec areas the minimum set net mesh size for both commercial and amateur fishers is 125 mm for rig and school shark<sup>5</sup> and 150mm for elephant fish<sup>6</sup>;
  - In all other areas the minimum set net mesh size for both commercial and amateur fishers is 150 mm for rig<sup>6</sup>, school shark<sup>7</sup> and elephant fish<sup>6</sup>;

### Sixth Schedule

- 76 As a general rule, all species subject to the QMS must be landed if taken. An exception is provided through the use of the Sixth Schedule to the Act, which provides for the release of quota species listed on that schedule and details specific conditions under which such releases may occur, such as a likelihood to survive on return.
- 77 This provision has been applied to the highly migratory species (HMS) of sharks that are managed under the QMS (i.e. porbeagle, blue, and mako sharks) to provide for the release of juveniles and large sharks. It also applies to rough and smooth skates and spiny dogfish. Conditions require that the release of all these species, with the exception of spiny dogfish, must be undertaken as soon as practicable after capture and the individuals must be alive at the time of release and considered likely to survive on return to the sea. As such discarding of these species does not constitute a risk to their sustainability.
- 78 Spiny dogfish may be returned to the sea whether they are alive or dead. In contrast to other shark species on the Sixth Schedule a large proportion of the spiny dogfish catch is an unwanted bycatch of the deepwater trawl fisheries. Spiny dogfish may be taken in significant numbers, and their likelihood of survival on release may be limited. Including this species on the Sixth Schedule recognises that spiny dogfish are a low value species that fishers may not wish to retain onboard, but that to ensure their sustainability it is necessary to monitor accurately the take of this species. Inclusion of spiny dogfish on the Sixth Schedule allows fishers to discard them as long as the amount discarded is accurately reported.

### Commercial catch balancing

- 79 Catch balancing is a key fisheries management tool designed to encourage commercial fishers to balance all their annual catch of QMS fish stocks with ACE. The objective is to ensure that the TACC is not overfished in any one year. Under

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<sup>5</sup> Fisheries (Auckland and Kermadec Areas Amateur Fishing) Regulations 1986 and Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986

<sup>6</sup> Fisheries (Amateur Fishing) Regulations 1986 and Fisheries (Commercial Fishing) Regulations 2001

<sup>7</sup> Fisheries (Central Area Amateur Fishing) Regulations 1986, Fisheries (Challenger Area Amateur Fishing) Regulations 1986, Fisheries (South-East Area Amateur Fishing) Regulations 1986, Fisheries (Southland and Sub-Antarctic Areas Amateur Fishing) Regulations 1991, Fisheries (Central Area Commercial Fishing) Regulations 1986, Fisheries (Challenger Area Commercial Fishing) Regulations 1986, Fisheries (South-East Area Commercial Fishing) Regulations 1986, Fisheries (Southland and Sub-Antarctic Areas Commercial Fishing) Regulations 1986.

this system, if a fisher does not hold sufficient ACE, they must pay a deemed value which is a financial disincentive for taking any catch in excess of that fisher's ACE. The deemed value is set at a rate that aims to provide incentives for all catch to be covered by ACE. Deemed values have been set for all species subject to the QMS and are revised regularly to ensure they are set at an appropriate level.

- 80 Permit suspensions prohibit fishers from fishing if deemed values in excess of \$1,000 are not paid within the required period of time. Fishing with a suspended permit is a criminal offence and attracts severe penalties.
- 81 Overfishing thresholds (specified as a percentage of ACE) apply to a few fishstocks where overfishing raises particular concerns, for example those species which are particularly at risk if they are overcaught. If an overfishing threshold is breached, the fisher is prohibited from continuing to fish in the area where the breach occurred for the remainder of the fishing year. No overfishing thresholds have been set for shark species.

### ***2.1.3 Non-QMS management framework***

- 82 There are in excess of 62 shark species<sup>8</sup> taken by commercial fishers in New Zealand that are managed outside the QMS. These accounted for between 11 and 16% by weight of sharks reported as commercial landings over the last five fishing years (see Appendix 2 for details). Within the non-QMS management framework, shark species may be managed in two ways –
- a) Open access; or
  - b) Limited access (species listing on Schedule 4C to the Act).
- 83 Measures to ensure the sustainability of stocks managed outside the QMS may be taken under section 11 of the Act.
- 84 These management options and sustainability tools are considered in more detail below.

### *Non-QMS management options*

#### Open access

- 85 The majority of shark species managed outside the QMS are maintained in an open access environment. All fishers require a fishing permit before they can fish commercially but this does not ration commercial access to a fishery because permits are granted upon request.
- 86 Most commercially targeted species have been introduced to the QMS and the majority of open access shark species are taken as a bycatch in these fisheries. Although there is no limit placed on the catch of most non-QMS species, the amount of incidental shark catch will to some extent depend on the total allowable catch of the QMS target species.

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<sup>8</sup> Sixty two species have been reported over the last 5 years but the actual number of species taken is likely to be greater when catch reported against generic codes is considered.

Limited access

- 87 Schedule 4C to the Act contains a list of species for which there is a moratorium on issuing fishing permits. Under the permit moratorium, fishers with existing permits for species listed on Schedule 4C may continue to fish for these species, but no new permits are able to be issued. For the last five fishing years less than 1% of the commercial shark catch has come from species listed on Schedule 4C.
- 88 Schedule 4C was created to ensure species identified as being subject to a sustainability risk in an open access environment were afforded protection prior to more appropriate management action being taken. Schedule 4C was not intended to be a permanent management solution for these stocks or species, but no timeframe has been specified for the application of management options which better meet the requirements of the Act.
- 89 Basking shark, hammerhead shark, sevengill shark and whale shark are included on Schedule 4C. There are no existing permits that allow fishers to target these species and, accordingly, they may be taken only as bycatch.

*Key statutory tools for ensuring the sustainability of non-QMS species*Section 11 sustainability measures

- 90 As detailed under the generic supporting frameworks section below, fishers are required to report the catch of non-QMS species. Such reports allow fisheries managers to identify sustainability concerns for non-QMS species, and to instigate appropriate management action.
- 91 Section 11 of the Act includes a non-exhaustive list of sustainability measures that can be used by fisheries managers to ensure that species managed under a non-QMS framework can be managed on a sustainable basis. These measures can relate to catch limits, restrictions on size/sex/biological state of any species taken, and area, method and seasonal fishing restrictions. These measures may be applied by regulation to fishers operating both within New Zealand's EEZ and for New Zealand vessels fishing on the High Seas. The most appropriate sustainability measure to be set or varied will depend on the precise nature of the issue being addressed.
- 92 The only sustainability measures currently in place for sharks relate to amateur bag limits. Under the Fisheries (South-East Area Amateur Fishing) Regulations 1986 and the Fisheries (Southland and Sub-Antarctic Areas Amateur Fishing) Regulations 1991, there are amateur bag limits of one for bronze shark, hammerhead shark, seven gilled shark and thresher shark.

**2.2 Generic supporting frameworks under the Act**

- 93 In addition to the sustainability tools discussed above, there is also a range of supporting frameworks available under the Act to ensure that fish stocks are utilised sustainably. These are generic across all QMS and non-QMS stocks, and stocks where utilisation is prohibited. Generic supporting frameworks include:
- a) Reporting

- b) Compliance
- c) Observer programme
- d) Research
- e) Consultation

### 2.2.1 Reporting

- 94 New Zealand's current commercial catch reporting system has been in operation since 1989. Under this system catch data are recorded within New Zealand's EEZ and Territorial Sea, and for New Zealand flagged vessels fishing on the High Seas that land their catch in New Zealand and elsewhere.
- 95 The reporting system involves a series of interrelated reporting requirements from both commercial fishers and licensed fish receivers (LFRs). LFRs are the sole agents who can lawfully purchase fish from fishers.<sup>9</sup> The various reports required from fishers and LFRs are reconciled and various data quality checks are performed to identify errors and maintain the integrity of the overall fisheries management system. Reports are subsequently filed by a central agency (FishServe) to provide information to fisheries managers.
- 96 There are specific reporting requirements for different types of fishing such as tuna longlining and trawling. Regardless of the fishing method used, the various reporting requirements ensure that all reported catch is recorded to species level,<sup>10</sup> including both QMS and non-QMS species, and whether the catch is landed, discarded, used as bait or eaten on board. The location of reported catch is available to at least the quota management area (QMA) level (or a generic fisheries management area (FMA) for non-QMS species).<sup>11</sup>
- 97 Data are typically available in greenweight.<sup>12</sup> For species processed onboard this is calculated through the use of conversion factors.<sup>13</sup>

### 2.2.2 Compliance

- 98 New Zealand's fisheries compliance regime seeks to maximise voluntary compliance with the fisheries management framework and to provide an effective deterrent to offending. To ensure compliance, New Zealand undertakes comprehensive monitoring, control, and surveillance of fishing. This occurs both within New Zealand fisheries waters and extends to New Zealand vessels fishing on the High Seas, from capture, through the point of landing, to processing, domestic

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<sup>9</sup> Quantities less than 10 kg (greenweight) are allowed to be sold by fishers as wharf sales.

<sup>10</sup> There are a number of generic codes that are available to fishers where they are unable to identify fish to species level.

<sup>11</sup> Spatial management units for QMS species are referred to as QMAs and are determined when a species is introduced to the QMS. Each QMA typically encompasses a separate stock of the species to which it relates. Management decisions for species not in the QMS are based on a series of generic areas referred to as FMAs. Ten FMAs span New Zealand's EEZ.

<sup>12</sup> Section 187 of the Act provides that all references to the weight of fish for reporting purposes are to be to the greenweight of fish (i.e. weight prior to processing).

<sup>13</sup> The Act provides for the use of conversion factors (CFs), as a ratio of processed weight to greenweight, to convert the weight of processed fish back to greenweight. Ministry of Fisheries observers collect CF data as part of their duties. The data are based on the species caught and the final product states of those species.

retail and export. Such compliance measures allow analysis and comparison of data from a number of sources to confirm that fishers are complying with legal requirements. This has relevance to shark species to ensure that catch limits, when set, are adhered to and that reporting arrangements have integrity.

99 Compliance tools include-

- Fishing permits and vessel registers
- A vessel monitoring system
- Vessel and gear marking
- Auditing of licensed fish receivers
- Monitored unloads of fish and control of transshipment
- Information management and intelligence analysis
- Boarding and inspection by fishery officers at sea
- Aerial and surface surveillance
- Education programmes
- Warnings, infringement notices and prosecution of offences

### **2.2.3 Observer programme**

- 100 A key component of the reporting and compliance systems is the observer programme. This programme was implemented in 1986 for the purpose of collecting reliable and accurate information for fisheries research, fisheries management, and fisheries enforcement. Each year, approximately 40 observers are deployed to monitor more than 6000 fishing days across a number of fisheries<sup>14</sup> (see Appendix 11 for details).
- 101 Observers record detailed information on the catches, discards and landed state of all species including sharks. This information is critical for determining the impact of fishing on shark species of little or no commercial value which are typically discarded if caught. In addition, observers collect biological samples from sharks which are then used in subsequent studies. Observers are also used to monitor the unloading of catch in New Zealand ports, the transshipment of fish, and to inspect the holds of vessels for catch.
- 102 Observers are deployed on vessels operating within the New Zealand EEZ and on the High Seas, including under bilateral arrangements on foreign-flagged vessels in the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) area.
- 103 The continued review of the observer allocation in all fisheries results in on-going improvements in observer coverage. In addition significant new initiative funding

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<sup>14</sup> Primarily orange roughy, oreos, hoki, southern blue whiting, ling, hake, scampi, squid, snapper, jack mackerel, tuna and toothfish.

was introduced in 2008 to facilitate the expansion of the observer programme into areas where there has been limited coverage historically.

#### 2.2.4 Fisheries research

- 104 The Ministry of Fisheries contracts a significant quantity of research, much of which is used to establish the status of fish stocks and to support the TAC setting process to ensure catch limits are set at sustainable levels. The research falls into six key areas each of which has its own specific goal. These research areas and associated goals are:
- *Fisheries resources* - to provide the information on sustainable yields and stock status required for the sustainable utilisation of New Zealand's fisheries resources;
  - *Harvest levels* - to determine the nature and extent of commercial and recreational catch, Māori customary take, and illegal catch and fishery induced mortality;
  - *Aquaculture and enhancement research* - to provide information to ensure that aquaculture and enhancement activities are sustainable and to determine the effects on wild fisheries and the aquatic environment;
  - *Aquatic environment research* - to determine the nature and extent of the effects of fishing on the aquatic environment and to assess the impact of diseases and exotic organisms on the sustainability of New Zealand's fishery resources;
  - *Cultural, economic, and social research* - to provide information on cultural, economic, and social factors that may need to be considered in the management decision making process to enable people to provide for their social, economic, and cultural well-being; and
  - *Traditional and customary research* - to provide information on the traditional and customary factors that may need to be considered in the management decision making process. This information enables the Minister of Fisheries to discharge her/his obligations to tangata whenua under the Deed of Settlement and the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 to enable Māori to provide for their traditional and customary well-being.
- 105 To review this research and identify any possible management concerns, the Ministry of Fisheries runs a working group process for a range of species groups including inshore, deepwater, and pelagic species. Currently 14 working groups meet throughout the year and, in addition to research providers, are composed of representatives from the recreational, commercial and customary sectors plus representatives from environmental interest groups. Sharks are considered within a number of these groups. The product of their deliberations is the annual Plenary Report which summarises the current state of knowledge for most important species. At the present time, summaries for the 11 shark species managed under the QMS are provided in the Plenary Report.
- 106 The Ministry of Fisheries also runs a research planning process along the same model as the working group process described above. The role of this group is to



develop Medium Term Research Plans for various fisheries that describe research and research needs for target and bycatch species. These plans are reviewed and updated annually and form the basis for research into sharks.

107 Examples of the types of research undertaken on sharks include:

- Research trawl surveys
- Analysis of commercial catch and effort data
- Stock assessments
- Biological studies to determine productivity
- Studies into the reproductive biology of porbeagle shark
- Characterisation of fisheries based on fisher and observer collected data
- Tagging programmes for rig and school shark and skates
- Recreational tagging programmes for shortfin mako and blue sharks

### **2.2.5 Non-fisheries research**

108 In addition to research initiated by the Ministry of Fisheries there are a number of other programmes which may provide useful information to inform the management of shark stocks in New Zealand. Such programmes include:

#### The bigfish project<sup>15</sup>

The bigfish project aims to record sightings of whale sharks, basking sharks, great white sharks, spine-tailed devil rays and manta rays found around New Zealand. The specific objectives of the project are:

- To determine the distribution and abundance of these species in New Zealand
- To determine where they originate from;
- To investigate where they go when they leave New Zealand.

#### Tagging programmes<sup>16</sup>

In 2005 electronic tags were used to track the movements of great white sharks.

#### Additional research programmes<sup>16</sup>

Additional research programmes undertaken in New Zealand include research into sensory systems, the population structure and breeding migrations of the short tailed stingray, age and growth studies, and global and regional genetic studies.<sup>17</sup>

<sup>15</sup> See [www.bigfish.net.nz](http://www.bigfish.net.nz) for further details

<sup>16</sup> In Francis, M.P. 2006: Chondrichthyan research in New Zealand. *Oceania Chondrichthyan Society Newsletter* 3:6-7.

<sup>17</sup> The Shark Barcode of Life (Shark-BOL) is a global effort to coordinate an assembly of a standardised genetic reference library for all shark species. It will ultimately provide a publicly available resource in the form of an

## 2.2.6 Consultation

### *Consultation among sectors within New Zealand*

- 109 Prior to implementing any sustainability measures the Minister of Fisheries is required, under section 12 of the Act, to consult with those classes of persons having an interest in the stock or the effects of fishing on the aquatic environment in the area concerned (including, but not limited to, Māori, environmental, commercial and recreational interests).
- 110 Statutory consultation occurs after policy options have been developed. An initial position paper (IPP) provides stakeholders with the opportunity to comment on the various options. A final advice paper (FAP) provides advice to the Minister that takes into consideration the submissions received during consultation.

### *Consultation between states*

- 111 The UN Fish Stocks Agreement<sup>18</sup> designates Regional Fisheries Management Organisations (RFMOs) as the primary vehicle through which states shall cooperate to bring about the conservation and management of straddling stocks and highly migratory stocks. New Zealand actively contributes to the development and implementation of conservation and management measures addressed by the RFMOs of which it is a member. Consistent with the UN Fish Stocks Agreement, New Zealand also cooperates and acts consistently with the conservation and management measures agreed by RFMOs to which it is not a member.
- 112 New Zealand is a member of four RFMOs and arrangements that manage fisheries. These are the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), the Western and Central Pacific Fisheries Commission (WCPFC), and the Arrangement between the Government of New Zealand and the Government of Australia for the Conservation and Management of Orange Roughy on the South Tasman Rise (STR). New Zealand has also signed the South India Ocean Fisheries Agreement (SIOFA), which is yet to come into force, is a cooperating non-party to the North-East Atlantic Fisheries Commission (NEAFC) and is a co-sponsor for the establishment of a South Pacific RFMO. Of these, decisions by the CCSBT and the WCPFC can directly impact on the management of highly migratory shark species (or sharks taken in conjunction with fishing for other highly migratory species) found within New Zealand fisheries waters, and on the activity of New Zealand nationals fishing on the high seas for these species. The rules set by other RFMOs affect the activities of New Zealand nationals fishing within the boundaries of the region to which they apply.
- 113 New Zealand became a party to the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) in 1989 and to the Convention on the Conservation of Migratory Species of Wild Animals (CMS) in

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electronic database containing DNA barcodes, images and geospatial coordinates of examined species. NIWA has completed DNA barcodes for approximately 50 shark species to date and this work is on going.

<sup>18</sup> Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 1995.

2000. Under these Conventions New Zealand may be obliged to restrict trade in, or fully protect, a particular species.

## 2.3 Additional statutory considerations under the Fisheries Act

### 2.3.1 Environmental Principles (section 9)

- 114 The Act prescribes three environmental principles that the Minister must take into account when exercising powers in relation to utilising fisheries resources and ensuring sustainability;

*Principle 1: Associated or dependent species should be maintained above a level that ensures their long-term viability*

*Principle 2: Biological diversity of the aquatic environment should be maintained*

*Principle 3: Habitat of particular significance for fisheries management should be protected.*

- 115 The Act defines ‘associated and dependent species’ as any non-harvested species taken or otherwise affected by the taking of a harvested species.<sup>19</sup> The term ‘long-term viability’ (in relation to a biomass level of a stock or species) is defined in the Act as a low risk of collapse of the stock or species, and the stock or species has the potential to recover to a higher biomass level.

- 116 The maintenance of biodiversity (including diversity within species, between species, and of ecosystems) needs to be considered in the context of the purpose of the Act, which is that, where possible, a resource may be used to the extent that sustainability is not compromised. Determining the level of fishing, or the impacts of fishing that can occur, requires an assessment of the risk that fishing might cause catastrophic decline in species abundance or cause biodiversity to be reduced to an unacceptable level.

- 117 Habitat is not defined in the Act, but the Ministry of Fisheries considers it to be ‘the place or type of area in which an organism naturally occurs’ (New Zealand Biodiversity Strategy). The maintenance of healthy fishstocks requires the mitigation of threats to fish habitat. Habitats of special significance to shark species should be protected and adverse effects on such areas must be avoided, remedied, or mitigated.

### 2.3.2 Information principles (section 10)

- 118 Section 10 of the Act requires decision makers to take into account a series of information principles. These apply to all decisions under the Act including the setting of a TAC or other sustainability measure. The information principles ensure that decisions are based on the best available information and that a cautious

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<sup>19</sup> The Act defines “harvested species” as any fish, aquatic life, or seaweed that for the time being may be taken with lawful authority. Fishers have lawful authority to take most species so few may be considered as “non-harvested” under the Act. Exceptions include those where a fisher does not have a permit to take a species listed on Schedule 4C to the Act – these are subject to the permit moratorium – and protected species such as marine mammals and most seabirds. These together constitute associated or dependent species.

approach is taken when information is uncertain, unreliable or inadequate. Section 10 also ensures that decision makers are not prevented from taking action to give effect to the purpose of the Act if information is uncertain or absent.

## 2.4 Key policy frameworks

- 119 In combination with statutory requirements and measures, the Ministry of Fisheries has developed, or is in the process of developing, a number of policy initiatives designed to support fisheries management, some of which have direct relevance to the conservation and management of sharks. While such policies have no direct standing in law they are derived from relevant statutes and serve to provide guidance as to how statutory provisions are administered. These policies may provide guidance on the operation of specific management frameworks, detail how the decision as to the most appropriate management framework for a given stock or species is made, and address the statutory requirement to avoid, remedy or mitigate any adverse effects of fishing on the aquatic environment.
- 120 Policy frameworks may be specific to individual management frameworks, or may be generic across all management frameworks. They may also guide how and when species may be moved between management frameworks. The key policy frameworks relevant to shark management form three broad groups:
- a) Fisheries plans;
  - b) Standards; and
  - c) Environmental policies.

### 2.4.1 Fisheries Plans

- 121 The Minister of Fisheries is able to approve a fisheries plan under s 11A of the Act and the Ministry of Fisheries is committed to the development of fisheries plans for all fisheries. These plans will state explicitly what the Ministry of Fisheries and stakeholders want from a fishery, how these common objectives are to be achieved, and how the state of a fishery in relation to achieving the objectives will be monitored. Fisheries plans will tie together strategy and operational decisions.
- 122 A fisheries plan will ultimately be a formal agreement between parties to manage a given fishery in a particular way. It will guide the Ministry of Fisheries to provide services and to advise the Minister of Fisheries in a certain way on decisions that he/she must make, and once the Minister approves a fisheries plan, guides him/her in making decisions in accordance with the fisheries plan. They provide a formal opportunity for stakeholders to have an input at the earliest stage of development, rather than seeking views on proposals already well developed by the Ministry of Fisheries.
- 123 Fisheries plans are designed to produce results and improve fisheries by providing for greater certainty, better management, more effective controls, less conflict, and provide a vehicle for the effective planning of fishing activities and business. They will form the key mechanism to incorporate formally the views and objectives of property rights holders and other legitimate stakeholders, into the management decisions for fisheries.

- 124 Management of shark fisheries will be addressed through the development of fisheries plans. Fisheries plans that will address the management of target or bycatch shark stocks, and the status of these plans, are shown in Table 3. Although still being developed it is likely that these plans will include specific objectives relating to shark stocks. For example, the Highly Migratory Species plan currently includes draft objectives relating to the management of the large pelagic sharks. Proposed objectives include maintaining the reproductive capacity of shark populations and a formal review of the management of the pelagic shark species to ensure it is aligned to international best practice.

**Table 3: Fisheries plans proposed or in progress that will address the management of sharks**

<b>Fisheries plan</b>	<b>Status</b>	<b>Key shark species to be included in each fisheries plan</b>
Challenger finfish	In progress	Elephant fish Rig Rough skate School shark Smooth skate Spiny dogfish
Chatham Islands	Proposed	School shark
East Coast North Island finfish	Proposed	Rig School shark Spiny dogfish
Deepwater trawl	In progress	Deepwater dogfish species
Highly migratory species	In progress	Blue shark Mako shark Porbeagle shark
Hoki	In progress	Basking shark Spiny dogfish
Kermadec	Proposed	Northern spiny dogfish School shark Spiny dogfish
North East Coast North Island finfish	Proposed	Rig School shark
Southern finfish	Proposed	Elephant fish Rough skate School shark
West Coast North Island finfish	In progress	Rig School shark

- 125 Target species may be the focus of individual fisheries plans and a stakeholder-led fisheries plan has already been developed for the Challenger rig fishery (SPO 7).<sup>20</sup> As most sharks are taken as bycatch, however, the majority of shark species will be incorporated in the relevant target species fisheries plan, or in a fisheries plan relating to a complex of fisheries in which a shark species is taken.

#### 2.4.2 Standards

- 126 The main purpose of fisheries standards is to establish clear, specific and measurable statements of results required to achieve fisheries outcomes. Standards fulfil three main functions:

<sup>20</sup> Fisheries Plan for the Management of Rig (*Mustelus lenticulatus*) in Quota Management Area 7 (SPO7). This plan was formally approved by the Minister of Fisheries in mid 2006 and can be found on the fisheries plan page of the Ministry of Fisheries website ([www.fish.govt.nz](http://www.fish.govt.nz)).

- *Guidance* – each standard will outline the Government’s position on the minimum level of performance expected from a fishery and the processes used to manage fisheries
  - *Consistency* – standards will ensure a consistent approach is taken across fisheries
  - *Monitoring* – standards will enable both Government and stakeholders to track the performance of management strategies
- 127 Standards may be set for ecosystems and fisheries, as well as for management activities. They may be expressed as a qualitative description, or a number, or as criteria to determine how a numerical value will be arrived at.
- 128 Standards do not have the weight of law, but rather are statements of policy on how legal obligations can be met. Standards will be a critical element in ensuring consistency across the range of fisheries plans that are being developed over the next few years.
- 129 Standards will be reviewed periodically to ensure that they are set at an appropriate level of detail and are only as restrictive as is necessary. However, where a standard is defined by statutory requirements, the standard cannot be altered without legislative change.
- 130 To date two standards have been approved by the Minister of Fisheries (the Deemed Value Standard and the Standard for the Identification of Candidate Stocks for QMS Introduction). A number of other standards are under development or proposed, including one relating to the identification of marine species for which a prohibition on utilisation should be considered. This standard is proposed for development in 2011. These standards are discussed further below.

### *Deemed Value Standard<sup>21</sup>*

- 131 As noted above, under the catch balancing framework, if a fisher does not hold sufficient ACE to cover their catch of a QMS stock, they must pay a financial penalty called a deemed value. The Deemed Value Standard sets out a process for consistently and transparently setting deemed values at a rate that provides an incentive for all catch to be landed and covered by ACE. Setting appropriate deemed values increases the level of confidence that QMS fishstocks, including those of shark species, are being fished within sustainable limits.

### *Harvest Strategy Standard<sup>21</sup>*

- 132 The Ministry of Fisheries has consulted on a Harvest Strategy Standard to guide the setting of catch levels for QMS stocks. This standard requires the setting of target, threshold, and limit reference points for all QMS fishstocks. It prescribes the performance levels that must be met but is relatively flexible about assessment of the range of possible factors that might contribute to a particular target level for an individual stock.

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<sup>21</sup> Available from the fisheries plan page of the Ministry of Fisheries website ([www.fish.govt.nz](http://www.fish.govt.nz)).

- 133 Application of the Harvest Strategy Standard will provide for greater consistency and transparency in the management of New Zealand fisheries and will also inform the public about the state of fishstocks. For the seafood industry there will be greater long-term certainty on which to plan business decisions. A standards-based approach will also enhance the likelihood of more New Zealand fisheries being able to be certified as environmentally sustainable.
- 134 The Harvest Strategy Standard provides an opportunity to increase the level of confidence that fishstocks, including those of shark species, are being managed sustainably. It reflects a growing trend internationally to avoid managing fishstocks at low biomass levels by shifting the balance between sustainability and short-term economic gain. The application of the proposed standard will promote a more cautious approach and may result in reduced catch limits in some instances. It will however increase the likelihood that fishstocks are sustainable in the long-term – even in the face of possible, as-yet-unknown, environmental changes.

*Standard for the identification of candidate stocks for QMS introduction<sup>21</sup>*

- 135 Section 17B of the Act requires stocks or species to be introduced into the QMS if the existing management framework is not ensuring sustainability or is not providing for utilisation of the stock or species,<sup>22</sup> unless the purpose of the Act would be better met by setting one or more sustainability measures under section 11. To meet its legislative obligations, and as part of its strategic direction, the Ministry has a policy preference for addressing sustainability and utilisation concerns through QMS introduction.
- 136 The Ministry of Fisheries uses a risk-based approach to assess non-QMS species against the sustainability and utilisation criteria for QMS introduction. The standard for the identification of candidate stocks for QMS introduction<sup>23</sup> sets out an annual process for the Ministry of Fisheries to identify stocks or species managed outside the QMS for which there are sustainability or utilisation concerns. These stocks are subsequently considered for introduction to the QMS by the Minister of Fisheries.
- 137 The standard was been developed taking into account relevant obligations, including the provisions of section 17A of the Act (which relates to highly migratory species taken outside New Zealand fisheries waters), and will contribute to the development of objectives-based fisheries management as described in the Ministry of Fisheries Statement of Intent 2008-2013. The standard defines a process that considers risks to achieving the following three generic objectives:
- To maintain the potential of the stock to meet the reasonably foreseeable needs of future generations.
  - To avoid remedy or mitigate any adverse effects of fishing on the aquatic environment.

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<sup>22</sup> Note that, when considering the introduction of species listed on Schedule 4C to the QMS, the Minister may decide to introduce these species regardless of whether or not (s)he is satisfied of the statutory tests relating to sustainability and utilisation.

<sup>23</sup> The standard was approved by the Minister of Fisheries in May 2008.

- To provide for utilisation that enables social, cultural and economic well-being.

138 This risk assessment is performed on all non-QMS species that satisfy one or more of a suite of broad criteria. These criteria are inclusive and have been developed to identify species that may exhibit sustainability, utilisation and/or environmental concerns.

### *Prohibited utilisation process standard*

- 139 A prohibited utilisation process standard is proposed for development. Although details have yet to be determined, it is anticipated that this standard will describe the process for generically assessing all species to identify those where no, or only limited, take is considered to be acceptable. Appropriate measures to prohibit utilisation will be determined subsequent to the operation of this standard.
- 140 As in the standard for the identification of candidate stocks for QMS introduction, assessment is likely to be risk based with a suite of appropriate criteria established against which stocks will be assessed on an annual basis. Criteria are likely to be informed, at least in part, by processes that have already been established.
- 141 Such processes may include a classification system<sup>24</sup> developed by the Department of Conservation (DOC) which classifies species (including marine species) according to their threat of extinction. Shark species for which a prohibition on utilisation is considered appropriate may also be identified by their inclusion under international conventions to which New Zealand is a party – primarily the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) and the Convention on the Conservation of Migratory Species of Wild Animals (CMS). Under these conventions New Zealand can be bound to restrict access to, or fully protect, a particular species.
- 142 Currently great white, whale and basking shark are listed in various appendices of these two conventions. Great white and basking shark are listed on Appendix 1 of the CMS. From 1 April 2007 great white shark was fully protected within New Zealand waters (under the Wildlife Act) and from New Zealand vessels on the high seas (under the Fisheries Act). In the near future, consultation will occur on full protection for basking shark. Whale shark is listed on Appendix 2 of both CITES and CMS and is currently being considered for protection under the Wildlife Act.
- 143 Three other shark and rays species are presently being considered for protection under the Wildlife Act as part of the Department of Conservations review of the schedules of that Act. The species are the smalltooth sandtiger shark (also known as the deepwater nurse shark)<sup>25</sup> and two species of manta rays.

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<sup>24</sup> Molloy, J.; Bell, B.; Clout, M.; de Lange, P.; Gibbs, G.; Given, D.; Norton, D.; Smith, N.; Stevens, T. 2002: Classifying species according to threat of extinction. A system for New Zealand. *Threatened species occasional publication 22*, 26p.

<sup>25</sup> New Zealand's deepwater nurse shark is in the same family as Australia's threatened gray nurse shark and shares the same extremely low productivity.



### 2.4.3 Environmental policies

- 144 In addition to the policies and initiatives directly supporting management of fishstocks, there are also specific policies proposed for development which will address the statutory requirement to avoid, remedy or mitigate any adverse effects of fishing on the aquatic environment. Although the detail has yet to be formalised it is intended that this work will address the impacts of fishing on habitats critical to marine species including sharks.
- 145 A number of initiatives already under development may also provide complementary protection for particular sites of importance to sharks, although this is not their primary focus. Such initiatives include:

#### *Marine Protected Areas Policy*

- 146 A key policy is the Marine Protected Areas Policy Statement and Implementation Plan (MPA Policy) which was developed to protect marine biodiversity. The MPA Policy is designed to meet the objectives of the New Zealand Biodiversity Strategy which reflect the commitment by the Government of New Zealand, through its ratification of the international Convention on Biological Diversity, to help stem the loss of biodiversity worldwide.
- 147 The MPA Policy is intended to guide the development of a representative network of MPAs using a number of marine management tools. The objective of the MPA Policy is to:

*Protect marine biodiversity by establishing a network of MPAs that is comprehensive and representative of New Zealand's marine habitats and ecosystems.*

- 148 In this context a MPA is defined as:

*An area of the marine environment especially dedicated to, or achieving, through adequate protection, the maintenance and / or recovery of biological diversity at the habitat and ecosystem level in a healthy functioning state.*

#### *Benthic Impact Strategy*

- 149 The primary objective of the Benthic Impact Strategy, which is currently under development, is to develop standards that, when met, will avoid future adverse effects and remedy or mitigate any past or present adverse effects of fishing on the benthic environment. Although not one of its specific aims, the Benthic Impact Strategy will avoid, remedy and/or mitigate the impacts of fishing on habitat of particular significance for sharks.
- 150 The Benthic Impacts Strategy will set out the process for developing Habitat Standards which will define the permissible level of impact on each broad habitat type found in New Zealand fisheries waters, based on an assessment of risk to the habitat type in question. Determining risk and significance of impact will be based on analysis of vulnerability of each habitat, and will incorporate the relative

resilience of biological and physical components of each habitat, the reversibility of the impact and, the relative importance of the habitat to ecosystem function.

- 151 By way of implementation, a number of options are available for limiting the bottom impacts of fishing and to ensure that Habitat Standards are met. Possibilities include modification of gear to ensure that impact does not exceed the permissible level on that habitat type, or closing one or more areas of that habitat to fishing methods that have an undesirable effect.

### *Additional habitat protection*

- 152 There are a number of areas where the use of specific fishing methods are, or are in the process of being, prohibited. Of particular note in relation to the protection of shark habitat are the set net bans to be implemented to protect the endangered Hector's and Maui dolphins, and the Benthic Protected Area (BPA) initiative.

### Set net ban

- 153 From 1 October 2008 set nets will be banned in a number of inshore areas to protect the endangered Hector's and Maui dolphins. Some of these areas are likely to be important habitat for sharks. The set net bans, although not established for this purpose, will provide some protection for sharks from the effects of fishing. Of particular benefit to sharks will be prohibitions on the use of set nets in the entrance to several harbours known to be used by sharks for pupping and as nursery areas.<sup>26</sup>

### BPA initiative

- 154 In November 2007 approximately 1.2 million square kilometres, comprising approximately 30% of New Zealand's EEZ, was closed to bottom trawling and dredging. The Benthic Protection Areas (BPA) initiative recognises that bottom trawling and dredging may have an adverse effect on the benthic environment and seeks to mitigate this impact by closing areas to these fishing methods that encompass a range of habitat types and are geographically dispersed across the EEZ. Although not a specific driver for deriving the closed areas, habitats of particular importance to sharks are likely to be protected within the BPAs.

## **2.5 Management of shark finning**

- 155 Shark finning is typically defined as the practice of removing the fins from a captured shark and returning the trunk to the sea. There has been widespread international interest in the practice of shark finning relating to both the waste of discarding unwanted trunks in the sea, and the cruelty aspect when a live shark is finned.

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<sup>26</sup> Set net bans will be established in the mouths of the Kaipara Harbour, Port Waikato, Manukau Harbour and Raglan Harbour.

### 2.5.1 Measures to minimise waste

- 156 A number of countries<sup>27</sup> have introduced measures to limit shark finning. While the specifics of how this is done vary by country, it typically involves the introduction of regulations that specify a maximum percentage of the landed weight of shark that may be comprised of fins. A figure of 5% of the dressed carcass weight is most often used. Less commonly, regulations require that the fins must be attached to the trunk at the time of landing. Such regulations effectively ban the discarding of trunks at sea. There is a cost involved in the onboard storage and landing of trunks and as a consequence such regulations provide an incentive to either obtain some financial return from the landed trunks or to avoid taking the sharks in the first place.
- 157 The Ministry of Fisheries considers that there is a risk in regulating to avoid waste in that such regulations may merely transfer the disposal site from the sea to the land (i.e. unwanted product is landed and discarded in land dumps). New Zealand has therefore taken an alternative approach that better fits with its fisheries management regime. This approach focuses on ensuring that sustainable catch limits are set for major target and bycatch shark stocks managed under the QMS, and that catch is accurately recorded and analysed to ensure that shark catch is constrained within these sustainable limits. Accurate catch reporting is also used to identify sustainability concerns for species managed outside the QMS, enabling appropriate and timely management action to be taken.
- 158 There are also a number of additional measures in place, including incentives under the QMS and the inclusion of several species on the Sixth Schedule of the Act, that serve to reduce the wastage of shark catch. These measures, along with details of the reporting framework, are discussed further below.
- 159 In addition there are a number of proposed measures, including development of a fisheries identification guide, that are designed to strengthen the reporting framework. These measures will improve the accuracy of catch data in general and in particular the catch data relating to lesser known shark species. A research and monitoring programme will also be initiated to evaluate, amongst other things, trends in the landed states of shark species and the efficacy of management measures aimed at enhancing the utilisation of shark catch. These initiatives are discussed in greater detail in Part 4 of the NPOA-Sharks.

#### *Incentives under the QMS*

- 160 There are incentives inherent in New Zealand's property rights system for commercial fishers to minimise waste. By providing quota holders with the secure right to harvest a portion of a natural resource, the QMS provides fishers with incentives to invest in the development of markets for a wider range of products derived from their catch. The amount of quota held for a particular stock represents the greenweight of that stock – utilising only a small proportion of that greenweight by only retaining shark fins may not maximise the return on the investment in that quota.

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<sup>27</sup> Including Australia, Brazil, Canada, Costa Rica, the United States, Mexico, South Africa and the countries comprising the European Union.

- 161 Similar incentives exist for fishers who do not own quota. All fishers must balance their catch of QMS species with ACE which is calculated on a greenweight basis. There is therefore an economic incentive for fishers to maximise the return from all of the QMS species they catch. The strength of this incentive will vary by fishery due to variables such as the difference between the value of product derived from bycatch and target species and whether vessels have the capacity to store product from bycatch species. In some circumstances however, incentives to maximise return from ACE can lead to fishers illegally dumping, discarding or highgrading<sup>28</sup> target species. MFish uses observer coverage and compliance and enforcement action to address these issues.
- 162 The inclusion of a species in the QMS may also eliminate a ‘race for fish’ mentality whereby fishers are encouraged to exploit high value and easily extracted components of a resource rather than adopt a more measured approach to the full utilisation of fish stocks.

### *Reporting and conversion factors*

- 163 New Zealand’s reporting framework has been designed to ensure that an accurate record of catch is available to inform the derivation of sustainable catch limits, and to ensure that fishers comply with such limits.
- 164 Section 187 of the Act requires that all references to the weight of fish are to be to the greenweight - that is the weight before any processing commences. To convert the weight of processed fish back to greenweight, the Act provides for conversion factors to be set as a ratio of processed weight to greenweight. Regardless of the percentage of individual fish that are retained by commercial fishers, conversion factors have been determined to ensure that the total tonnage of animals removed from a stock is reported. For most shark species, the conversion factor from the wet fin processed state back to greenweight is 30, although some shark species have different conversion factors (e.g. porbeagle (45), blue (48), and mako (59) sharks).
- 165 There is a further complication, however, in that the moisture content of shark fins declines over time at a rate dependent on how the fins are stored. As a consequence separate conversions factors for wet and dried fins have been provided for mako, blue and porbeagle sharks. No conversion factors for dried fins have been provided for other species of shark and it is possible that greenweight of these species may be underestimated when they are landed as fins only. In addition, for those species where specific conversion factors do exist for dried fins, these may not be used by fishers.
- 166 The Ministry of Fisheries acknowledges that there are inherent difficulties in setting and applying these types of conversion factors. For example if dried fins are recorded as wet fins, or fins are reported against an incorrect species code there may be inaccuracies in reported landings which have the potential to compromise assessments of shark catch and, ultimately, the sustainability of shark stocks. On balance, however, the Ministry of Fisheries considers that the reporting framework is operating effectively to support the management and monitoring of shark stocks.

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<sup>28</sup> The process whereby less valuable individuals of the target species (usually those that are small or damaged) are illegally discarded.

Outstanding issues surrounding the accuracy and use of appropriate conversion factors are addressed in Part 4 of the NPOA-Sharks.

### *The Sixth Schedule*

- 167 Under New Zealand law it is illegal to discard QMS species. The only exception is for those species listed on the Sixth Schedule of the Act and a number of shark species are included under this provision including large pelagic shark species (blue, mako and porbeagle shark) and spiny dogfish. Stocks on the Sixth Schedule may only be returned to the sea in accordance with stated requirements. For the pelagic sharks only live sharks that are likely to survive on return are allowed to be returned, and such releases must take place as soon as practicable after the shark is taken. This provides for the release of juveniles in particular but is also intended as a bycatch management tool.
- 168 Spiny dogfish is the only species on the Sixth Schedule that may be released either alive or dead. The large amount discarded reflects the low capacity of fishers to utilise unwanted bycatch of this species.<sup>29</sup> A special reporting code which applies only to this species ensures that catch is counted against quota.

### **2.5.2 Finning and animal welfare**

- 169 Under the Animal Welfare Act 1999 it is an offence to wilfully ill-treat (s 28), or to ill-treat (s 29(a)), an animal. While the Animal Welfare Act only applies within New Zealand's Territorial Sea, the offence of wilfully ill-treating an animal can extend to vessels fishing in the EEZ and on the High Seas. This is because the Summary Proceedings Act 1957 lists s 28 of the Animal Welfare Act as an indictable offence. Any indictable offence is classified and treated as a crime under the Crimes Act 1961.<sup>30</sup> Under section 8 of the Crimes Act, the jurisdiction in respect of crimes on ships is extended beyond New Zealand territorial waters in certain specified circumstances. An offence under s 29(a) of the Animal Welfare Act does not constitute an indictable offence.
- 170 The Ministry of Fisheries considers that the practice of removing the fins from a live shark fits within the definition of ill-treating an animal, as defined in s 2 of the Animal Welfare Act. For such ill-treatment to be considered wilful the person finning a live shark must be aware that such action constitutes ill-treatment, rather than considering it a normal operating procedure on a vessel.
- 171 A code of practice<sup>31</sup> was developed by Industry in 2001 to codify the safe handling, processing and unloading of sharks in the tuna fishery. The code of practice states that all sharks should be killed humanely and describes how this should be done. While it should be generally apparent that the live finning of a shark is ill treatment, the Ministry of Fisheries undertakes to ensure that the ill treatment aspect of live finning is clearly conveyed to all fishers operating in fisheries where shark finning

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<sup>29</sup> The full rationale for listing this species on the Sixth Schedule is discussed in Part 2.

<sup>30</sup> Crimes Act 1961, s 11.

<sup>31</sup> The code of practice for safe handling, processing and unloading of sharks is included in Appendix 11.

takes place. This will ensure that live finning will be an offence both within and beyond New Zealand's Territorial Sea.

- 172 The Ministry of Agriculture and Forestry (MAF) is the government department with responsibility for the Animal Welfare Act. The Ministry of Fisheries undertakes to ensure that information is provided to MAF where live finning is seen to take place by observers or fisheries officers. Further details of these actions are provided in Part 4.

## PART 3 ALIGNMENT WITH THE IPOA-SHARKS

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- 173 The IPOA-Sharks specifies three levels of objectives:
- a) The overarching goal;
  - b) The guiding principles; and
  - c) The proposed objectives for an NPOA-Sharks.
- 174 The following discussion examines the alignment of fisheries management in New Zealand with the IPOA-Sharks.

### 3.1 IPOA-Sharks overarching goal

- 175 The overarching goal of the IPOA-Sharks is to ensure the conservation and management of sharks and their long-term sustainable use. This goal is closely aligned with New Zealand's fisheries management system. The Ministry of Fisheries believes that New Zealand's current management system for sharks, as summarised in Appendix 1, satisfies the overarching goal of the IPOA-Sharks.

### 3.2 IPOA-Sharks guiding principles

- 176 To achieve the overarching goal at a national level, the IPOA-Sharks defines three guiding principles for the development of an NPOA-Sharks. These are:
- i) **Participation-** States that contribute to fishing mortality of a species or stock should participate in its management.
  - ii) **Sustaining stocks-** management and conservation strategies should aim to keep total fishing mortality for each stock within sustainable levels by applying the precautionary approach.
  - iii) **Nutritional and socio-economic considerations-** management and conservation objectives and strategies should recognise that in some low-income food-deficient regions and/or countries, shark catches are a traditional and important source of food, employment and/or income. Such catches should be managed on a sustainable basis to provide a continued source of food, employment and income to local communities.

#### 3.2.1 Participation

- 177 New Zealand is committed to the sustainable management of fish stocks and actively manages New Zealand's fisheries resources using numerous management mechanisms as outlined in Part 2. This includes the management of shark species that are taken within our Territorial Sea and Exclusive Economic Zone (EEZ), and participation in the management of highly migratory species taken in our waters and by New Zealand-flagged vessels on the High Seas.

### 3.2.2 *Sustaining stocks*

- 178 The primary focus of New Zealand's fisheries management system is to ensure stocks are harvested sustainably. This is achieved through setting limits on Total Allowable Catches (TACs) for most important species under the Quota Management System. Where species are not introduced into the QMS a variety of management controls are available.
- 179 Regardless of the framework under which a species is managed, section 10 of the Act requires that decision makers exercise caution when making management decisions relating to the sustainable utilisation of a fisheries resource when faced with uncertain, unreliable or inadequate information.
- 180 Where analysis determines that the nature of a stock or species is such that no active utilisation is desirable, measures can be put in place to prohibit, or severely limit, harvest of that stock or species under the Fisheries Act or conservation legislation such as the Wildlife Act.

### 3.2.3 *Nutritional and socio-economic considerations*

- 181 New Zealand is not a low income or a food deficient region. Nonetheless shark catches are an important source of employment in some areas and some species of shark are utilised locally as a source of food. Examples include targeted fisheries for school shark and rig.
- 182 Historically some shark species have formed a food source for Māori in a number of areas in New Zealand, and they were also used for trade between tribes and later with European settlers. While shark catch is no longer a significant food source for Māori, there remains some customary interest in a number of shark species.
- 183 The allocation of the catch of QMS species under the Act requires that an allowance is made for customary fishing that should fully satisfy customary interests. The customary fishing regulations (Fisheries (South Island Customary Fishing) Regulations 1999 and the Fisheries (Kaimoana Customary Fishing) Regulations 1998) do not provide for the Crown to place limitations on customary fishing, apart from to ensure the sustainability of a particular stock. Shark species for which an allowance has been provided for customary take include elephant fish, school shark, spiny dogfish and rig. Small allowances have also been made for rough and smooth skate and blue, mako and porbeagle sharks.
- 184 Customary take is regulated through the authorisation system in the customary regulations that requires all customary fishing to be undertaken in accordance with tikanga (custom) and the overall sustainability of the fishery.
- 185 Shark species for which a recreational allowance has been made include elephant fish, school shark, spiny dogfish, blue shark, mako shark, thresher shark, and rig. Small allowances have also been made for rough and smooth skate.
- 186 Some shark species are important game fish in New Zealand waters. These include mako sharks which are highly prized as a game fish and to a lesser extent blue and porbeagle sharks which are the primary target game fish in southern New Zealand. Sharks are mostly released on capture and many are tagged on release as part of an



opportunistic game fish tagging programme to provide information on the distribution and movement of key shark species.

### 3.3 Proposed objectives of an NPOA-Sharks

187 At a more specific level, the IPOA-Sharks proposes a suite of ten objectives for the development of an NPOA-Sharks. These ten objectives are:

- 1) *Ensure that shark catches from directed and non-directed fisheries are sustainable.*
- 2) *Assess threats to shark populations, determine and protect critical habitats and implement harvesting strategies consistent with the principles of biological sustainability and rational long-term economic use.*
- 3) *Identify and provide special attention, in particular to vulnerable or threatened shark stocks.*
- 4) *Contribute to the protection of biodiversity and ecosystem structure and function.*
- 5) *Minimise unutilised incidental catches of sharks.*
- 6) *Minimise waste and discards from shark catches in accordance with article 7.2.2.(g) of the Code of Conduct for Responsible Fisheries (for example, requiring the retention of sharks from which fins are removed).*
- 7) *Encourage full use of dead sharks.*
- 8) *Facilitate improved species-specific catch and landings data and monitoring of shark catches.*
- 9) *Facilitate the identification and reporting of species-specific biological and trade data.*
- 10) *Improve and develop frameworks for establishing and co-ordinating effective consultation involving all stakeholders in research, management and educational initiatives within and between States.*

188 The Ministry of Fisheries considers that, while the ten objectives vary in their relevance to New Zealand fisheries, they may be usefully grouped into four broad categories: sustainability, utilisation, environmental, and additional considerations. These are discussed below.

189 As discussed, New Zealand's fisheries management system has a number of legislative and policy tools, and reporting and consultation requirements, that address sustainability, utilisation, and environmental considerations. Many of these tools are already used in the management of shark stocks.

#### 3.3.1 Sustainability

190 Three of the IPOA-Sharks objectives can be grouped into the sustainability category:

- i) Ensuring that target and incidental take is sustainable (IPOA-Sharks objectives 1 and 2)

- ii) Assessing threats to shark populations (part of IPOA-Sharks objective 2)
- iii) Protecting threatened and endangered shark species (IPOA-Sharks objective 3)

- 191 As noted in Part 2, the goal of fisheries management in New Zealand is the sustainable utilisation of fisheries resources. Target stocks and commercially valuable bycatch stocks are typically managed under the QMS and eleven shark species are currently managed in this way. Species that are infrequently encountered by fishers typically remain in an open access environment; however these species are still subject to some reporting requirements and other management tools short of full introduction to the QMS. Where no utilisation is deemed appropriate some species may be actively protected.
- 192 Decisions on which of the three general management approaches (QMS, non-QMS or prohibited utilisation) is appropriate for different shark species is prompted by an assessment of the threats to shark populations. This process does not involve a specific assessment of the status of all shark species. The assessment of shark species is however captured in generic processes for assessing appropriate management intervention for aquatic species; this includes provision for protection of endangered or threatened shark species.

### 3.3.2 Utilisation

- 193 Four of the IPOA-Sharks objectives can be grouped into the utilisation category:
- i) Implement harvesting strategies consistent with the principles of rational long term use (part of IPOA-Sharks objective 2)
  - ii) Minimise unutilised incidental catches of sharks (IPOA-Sharks objective 5)
  - iii) Minimise waste and discards from shark catches in accordance with article 7.2.2 (g) of the Code of Conduct for Responsible Fisheries<sup>32</sup> (IPOA-Sharks objective 6)
  - iv) Encourage full use of dead sharks (IPOA-Sharks objective 7)
- 194 It is explicit in the purpose statement of the Act that the sustainable utilisation of fish stocks is a long term goal that incorporates the requirement to meet the needs of future generations. The primary components of the QMS, associated management controls, and the harvest strategies described in Part 2 are all intended to ensure the rational long term use of New Zealand's fishery resources.
- 195 The remaining three components of the utilisation objective relate to waste minimisation. There are two aspects to the consideration of waste minimisation in shark fisheries. Firstly, there is a general conservation ethic expressed in the desire to maximise the use of natural resources, and secondly, and more specifically related to sharks, there is concern over the inherently wasteful practice of shark finning.

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<sup>32</sup> 7.2.2(g) states that management measures should be adopted that ensure that; *'pollution, waste, discards, catch by lost or abandoned gear, catch of non-target species, both fish and non-fish species, and impacts on associated or dependent species are minimized, through measures including, to the extent practicable, the development and use of selective, environmentally safe and cost-effective fishing gear and techniques'*.

- 196 Both the IPOA-Sharks and the FAO Code of Conduct for Responsible fisheries encourage full utilisation. New Zealand agrees that minimising waste from the use of natural resources is to be encouraged, and considers that this position fits within the overarching goal of fisheries management in New Zealand to maximise the value New Zealanders obtain through the sustainable use of fisheries resources.
- 197 Analysis of the reported commercial shark catch in New Zealand suggests that the percentage of utilised product varies between shark fisheries, and ranges from the near full utilisation of certain species, to the disposal of whole sharks in the case of others. Approximately 28% of total reported shark catch in New Zealand is discarded dead at sea (Appendix 4) with most of the remainder processed and landed in some form (Appendix 4). Of the total reported shark catch approximately 7% is landed as fins only (Appendices 7 and 8). Large pelagic sharks (mako, blue and porbeagle) comprise a significant proportion of finned sharks while unwanted bycatch species that are discarded whole are dominated by spiny dogfish.
- 198 New Zealand has not implemented specific legislative requirements to fully utilise, or to minimise the waste from, the harvest of fish species in New Zealand. Rather New Zealand's focus has been to ensure that catch is constrained within sustainable catch limits. There are, however, a number of measures that are in place or are proposed to reduce the wastage of shark catch. These measures in relation to shark finning are discussed in Part 4 of the NPOA.
- 199 A further avenue for increased utilisation of shark catch is the extraction of oil from the livers of deepwater dogfish. Appendix 7 shows that a quantity of deepwater shark livers is already landed in New Zealand. The Ministry of Fisheries supports and encourages the utilisation of shark livers from deepwater sharks that are taken as incidental catch. The Ministry of Fisheries has recently been made aware of commercial opportunities related to the extraction and refining of shark liver oil and has informed fishers and Licensed Fish Receivers who have taken or received deepwater dogfish of this opportunity.

### **3.3.3 Environmental considerations**

- 200 Two of the IPOA-Sharks objectives can be grouped into the environmental category:
- i) Determine and protect critical habitats (part of IPOA-Sharks objective 2)
  - ii) Contribute to the protection of biodiversity and ecosystem structure and function (IPOA-Sharks objective 4)
- 201 As described in Part 2, ensuring sustainability while providing for utilisation is the overarching purpose of the Fisheries Act. The definition of 'ensuring sustainability' includes 'avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment'. Section 9 of the Act also prescribes three environmental principles that the Minister must take into account when exercising powers in relation to utilising fisheries resources and ensuring sustainability.
- 202 There is a range of tools available under section 11 of the Act that may be applied to meet New Zealand's statutory environmental obligations. Section 11 specifically provides for the setting of sustainability measures after taking into account the effects of fishing on the aquatic environment. Such sustainability measures may

relate to limits on the size, sex and biological state of individuals that may be taken, catch limits and area, season and method restrictions.

- 203 New Zealand also undertakes a suite of research programmes linking conservation, environment, fisheries and biodiversity under a single New Zealand Biodiversity Strategy (NZBS). This Strategy contributes to Government's strategic goals of halting the decline of New Zealand biodiversity and of protecting and enhancing the environment. Funds provided under the NZBS support research programmes investigating marine biodiversity and marine ecosystem function within the New Zealand EEZ and New Zealand's Antarctic dependency in the Ross Sea.
- 204 There are a number of areas where the use of specific fishing methods is prohibited by regulation. Under the BPA initiative approximately 30% of New Zealand's EEZ was closed to bottom trawling and dredging. From 1 October 2008 set net use will be prohibited in a number of inshore areas to protect the endangered Hector's and Maui dolphins.<sup>33</sup> Although not designed to protect sharks, both of these initiatives will protect areas of shark habitat from fishing. Some areas that will be closed to set netting will be particularly beneficial for sharks, including those located in the entrance to several harbours known to be used by sharks for pupping and as nursery areas.
- 205 Development of the Marine Protected Areas (MPA) Policy will further protect New Zealand's marine biodiversity. Implementation of the MPA Policy will establish a network of marine protected areas that is comprehensive and representative of New Zealand's marine habitats and ecosystems and may make significant contributions to protecting critical shark habitat, the protection of shark biodiversity and overall ecosystem structure and function.

### **3.3.4 Additional Considerations**

#### *Reporting*

- 206 There are two IPOA-Sharks objectives that relate to the reporting requirements;
- i) Facilitate improved species-specific catch and landings data and monitoring of shark catches (IPOA-Sharks objective 8)
  - ii) Facilitate the identification and reporting of species-specific biological and trade data (IPOA-Sharks objective 9)
- 207 New Zealand's reporting system is generally in accordance with these objectives as discussed in Part 2 of the NPOA-Sharks. Additional measures to improve the reporting of shark take are detailed in Part 4.

#### *Consultation*

- 208 There is one IPOA-Sharks objective that relates to consultation requirements;

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<sup>33</sup> An application for a judicial review of the set net prohibitions has been lodged by the fishing industry.

- i) Improve and develop frameworks for establishing and co-ordinating effective consultation involving all stakeholders in research, management and educational initiatives within and between States (IPOA-Sharks objective 10)
- 209 New Zealand's consultation processes are in accordance with this objective. Details of how New Zealand facilitates consultation with stakeholders in New Zealand, and between States, have been discussed in Part 2 of the NPOA-Sharks.

## PART 4 PLAN OF ACTION

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210 Based on our current knowledge and the discussion in Parts 2 and 3 of the NPOA-Sharks, a number of actions are required to improve the conservation and management of shark species in New Zealand waters. While significant improvements have occurred in shark management in recent years, it is also appropriate to undertake a review of the effectiveness of these existing and proposed measures in the medium term.

211 Actions consist of the following;

### Actions to eliminate live shark finning:

*i) Ensure fishers are aware that live finning of sharks constitutes ill-treatment and is an offence under the Animal Welfare Act*

The Ministry of Fisheries will ensure that the cruelty aspect of live finning is articulated clearly to fishers operating in fisheries where shark finning takes place.

Due: Ongoing

*ii) Establish reporting protocol to enforce the Animal Welfare Act*

A reporting protocol will be established to ensure that any observed instances of live finning are reported to the Ministry of Agriculture and Forestry (MAF).

### Actions to ensure appropriate management of threatened and endangered species

*iii) Protect Basking Shark*

As basking shark is listed on Appendix 1 of CMS, New Zealand has an obligation to provide protection for this species in New Zealand waters and from New Zealand vessels fishing on the High Seas.

Due: 2009

*iv) Develop and implement a prohibited utilisation process standard*

The standard will be used to identify marine species where no level of utilisation is considered to be sustainable.

Due: 2011

### Actions to review shark management

*v) Review Schedule Six provisions in relation to spiny dogfish*

The Ministry of Fisheries will review the Schedule six provisions currently in place for spiny dogfish to ensure that they are appropriate.

Due: 2010

*vi) Review listing other shark species, or specific life stages of other shark species, on Schedule Six*

The Ministry of Fisheries will review the use of Schedule six provisions to allow the live release of additional shark species, or specific life stages of other shark species.

Due: 2012

*vii) Review and revision of NPOA*

A full review and revision of the NPOA-Sharks will be undertaken.

Due: 2012

Actions to improve information

*v) Strengthen existing research and monitoring programme*

The strengthened programme will address:

- stock status and sustainable yields for exploited shark stocks
- effectiveness of conversion factors in achieving accurate greenweight;
- monitoring of wastage in shark fisheries;
- assessment of measures to promote improved utilisation;
- identification of areas of habitat of particular significance to shark species (e.g. spawning, pupping and nursery grounds); and
- review research and monitoring outputs to assess the effectiveness of shark management.

Due: Ongoing and fully reviewed in 2012

*vi) Reduce use of generic shark reporting codes*

Reduce the percentage of the total commercial shark catch recorded against generic codes to below 1%.

Due: 2010-2011 fishing year

*vii) Produce a field identification guide*

Production of a draft field identification guide for all QMS and other fish species (including sharks) commonly caught in commercial and non-commercial fisheries.

Due: 2008

Actions to meet international obligations

*viii) Participate in relevant Regional Fisheries Management Organisations (RFMOs) and other relevant international fora*

Actively participate in the management and research of shark species which are managed through RFMOs of which New Zealand is a member; actively participate in other international fora engaged in the conservation and management of sharks; and support initiatives by other organisations/agencies to collect information on the distribution and abundance of shark species.

Due: Ongoing

## 4.1 Fish identification guide

- 212 Many sharks are of low economic value compared to other species and are therefore primarily non-target species. This, in conjunction with the sparse distribution typical of apex predators such as sharks, has meant that fishers in New Zealand have a low encounter rate with many shark species and fishers consequently have difficulty in accurately identifying landed sharks to species level. While the reporting system is comprehensive, accurate information on the commercial take of shark species depends on the ability of fishers to identify shark species; this has led to many fishers reporting shark catch by the various generic codes available to them.<sup>34</sup>
- 213 The Ministry of Fisheries proposes to address this issue through the production of an updated and comprehensive fish identification guide. While a number of identification guides are available both in New Zealand<sup>35</sup> and internationally<sup>36</sup> that address components of New Zealand's shark fauna, there is currently no single guide suitable for fishers to easily and accurately identify and code the full range of shark species that they may encounter in their day-to-day fishing operations.
- 214 An identification guide for all fish species (including sharks) taken in commercial fisheries is currently under development. The guide will complement existing guides for deepsea invertebrates<sup>37</sup> and offshore crab species.<sup>38</sup> It will be in the form of a pictorial field guide with images and information also held in a national database that permits electronic access. Ultimately the guide will cover all QMS species, species that are commonly confused with QMS species, species common in bycatch, and species that may be vulnerable to overexploitation in bycatch. The first iteration of the guide will prioritise species typically encountered in commercial fisheries.<sup>39</sup>

## 4.2 Generic codes

- 215 Appendix 3 shows that the percentage of commercial shark catch that has been reported against generic codes for the last five fishing years has remained relatively stable at about 4-5%. This is dominated by the code OSD which stands for 'other

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<sup>34</sup> Generic codes include CHI (chimaera), DWD (deepwater dogfish), OSD (other sharks and dogfish), OSK (other skates), RAY (rays) and SKA (skates).

<sup>35</sup> 'Ministry of Fisheries observer programme biological data collection manual' Ministry of Fisheries (2002); 'An identification guide for deepwater shark species', NIWA (2002), and 'Sharks and Rays of New Zealand', Cox and Francis (1997).

<sup>36</sup> 'Marine species identification manual for horizontal longline fishermen', Secretariat of the Pacific Community (2006) and 'A handbook on sharks caught in SBT fishing grounds', Commission for the Conservation of Southern Bluefin Tuna (2003).

<sup>37</sup> Tracey, D.M.; Anderson, O.F.; Clark, M.R.; Oliver, M.D. (2005). A guide to common deepsea invertebrates in New Zealand waters. *New Zealand Aquatic Environment and Biodiversity Report No.1*. 160 p.

<sup>38</sup> Naylor, J.R.; Webber, W.R. and Booth, J.D. (2005). A guide to common offshore crabs in New Zealand waters. *New Zealand Aquatic Environment and Biodiversity Report No.2*. 47 p.

<sup>39</sup> A list of species to be included in the first iteration of the guide has been finalised and includes over 75% of the shark species taken by fishers in New Zealand waters. The remaining species will be included in future iterations of the guide.



sharks and dogfish'. While the use of generic codes is limited, their use compromises the ability of the reporting framework to reflect accurately the take of individual shark species, particularly for lesser known or infrequently encountered species. Introduction of the identification guide discussed above will increase the ability of fishers to identify such species and should decrease the use of the generic codes over time.

- 216 Regardless of the effectiveness of the proposed guide it is not possible, nor desirable, to eliminate generic codes altogether. If a fisher is unable to identify a shark, it is preferable that it is recorded against a generic code rather than recorded against an incorrect code. Maintaining these codes will ensure that the efficacy of the guide can be monitored through the use of generic codes on an ongoing basis, and will help to ensure that the take of a species is not inflated by misreporting of an unidentified shark species against another species code.
- 217 The percentage of shark catch recorded against generic codes will be monitored with the aim of reducing their use to below 1% of the total shark catch by 1 October, 2010. The success of the guide in reducing the use of generic codes will be monitored annually to ensure that appropriate progress towards the target figure is being made. Additional actions to educate fishers on the use of the guide may be required if appropriate progress is not made.

### 4.3 Strengthen existing research and monitoring programmes

- 218 Research and monitoring measures (including the reporting and record keeping framework, research projects, observer data, monitoring programmes under the AMP framework etc.) are an integral component of fisheries management and ensure that timely and appropriate action is taken when sustainability concerns arise. Existing research and monitoring measures in place for shark species will, subject to new funding, be strengthened to better enable sustainability concerns that occur for both QMS and non-QMS shark species to be identified and addressed in a timely fashion.
- 219 The process of strengthening research and monitoring measures will be achieved, subject to new funding, through additional research projects initiated through the standard research planning process and measures advanced through the adaptive management programme (AMP) for those shark stocks currently managed under that framework. In addition a holistic desktop review will be undertaken prior to full review of the NPOA in 2012. This project will review all research and monitoring outputs relating to sharks and assess the effectiveness of shark management across New Zealand's shark fauna. This project will be crown funded.
- 220 The research and monitoring programme will inform appropriate actions to address sustainability concerns. Such actions may include instigating improved management measures for a particular shark species within its existing management framework; the movement of a shark species from non-QMS to QMS management in response to sustainability and/or utilisation concerns under an open access system; or prohibiting utilisation when no or only limited take is considered sustainable.

- 221 A new initiative bid for science funding to support the NPOA-Sharks will be advanced in 2008.

#### **4.3.1 Aim**

- 222 The primary aim of the strengthened research monitoring programme is to collect information to allow evaluation of the effectiveness of current management measures in achieving the purpose and objectives of the NPOA-Sharks.
- 223 On the basis of outputs from the strengthened research and monitoring programme, management measures in place for all shark species will be reviewed every 3-5 years.

#### **4.3.2 Method**

- 224 The activities to be undertaken as part of the strengthened research and monitoring programme are discussed below in relation to:
- Sustainability
  - Utilisation
  - Environmental considerations
  - Additional considerations

#### *Sustainability*

- 225 The efficacy of management measures to ensure sustainability will be determined through the collection and analysis of data from various sources:
- i) Trends in abundance as estimated from research surveys, observer data, commercial catch and effort, recreational fishing data (including gamefish tagging programmes) and other sources (e.g. tag-recapture data)
  - ii) Trends in catches, e.g. are catch limits being regularly exceeded or substantially undercaught
  - iii) Trends in the sizes and maturity stages of sharks taken based on observer data
  - iv) Characterisation of the nature of shark catches in various fisheries, e.g. target versus bycatch, to assess risks to shark populations
  - v) Stock assessments will be undertaken for those species for which sufficient data exist
  - vi) Biological studies to obtain or refine estimates of the productivity of shark populations
- 226 In the case of highly migratory species (HMS) or straddling stocks, the data collection may be undertaken by multiple states, with analyses undertaken in regional fora, e.g. RFMOs.

*Utilisation*

- 227 The efficacy of management measures to provide for utilisation will be determined through the collection and analysis of data from various sources including:
- i) Analysis of observer and fisher collected data on the fate of sharks (e.g. retained versus discarded)
  - ii) Analysis of the effectiveness of Sixth Schedule provisions for shark species
  - iii) Review of conversion factors used to convert processed weight to greenweight
  - iv) Monitor the use of processed states over time to determine trends in utilisation

*Environmental considerations*

- 228 Analysis of environmental considerations will be based primarily on data collected by scientific observers and through dedicated research programmes such as:
- i) Analysis of diet data
  - ii) Effects of fishing research programmes

*Additional considerations*Efficacy of reporting measures

- 229 The efficacy of reporting measures will be determined through monitoring of the use of 'generic' shark codes and the comparison of fisher and observer reports.

Comprehensive review of research and monitoring outputs to assess the effectiveness of shark management

- 230 Prior to review of the NPOA in 2012, all research and monitoring outputs relating to sharks will, subject to funding, be formally compiled and reviewed. The formal review will be undertaken as a dedicated research project advanced through the 2010 research planning round.
- 231 The project will be a desktop study that will compile all the important biological information from directed research (e.g. through AMPs and standard research processes), all fisheries dependent data (e.g. catch and catch per unit effort data), and any additional available information on both QMS and non-QMS shark species (e.g. observer data).
- 232 This project will be crown funded.

**4.3.3 Output**

- 233 The results of research and monitoring may identify instances where current management measures are not adequately meeting the objectives of the IPOA-Sharks. If such gaps are identified, new or modified management measures will be put in place, with additional monitoring to determine their effectiveness.

## 4.4 Participate in relevant RFMOs and other relevant international fora

### 4.4.1 RFMOs

- 234 As noted previously, some of the shark species taken within New Zealand waters are highly migratory in nature and furthermore New Zealand-flagged vessels are involved in fisheries outside of New Zealand waters in which sharks are sometimes encountered as bycatch.
- 235 New Zealand will work with members of relevant RFMOs to ensure that the principles of the IPOA-Sharks are being advanced. In particular, New Zealand will seek improved reporting of shark catches and collaborative research amongst members leading to full stock assessments for key shark species through the Ecologically Related Species Working Group of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT-ERSWG) and the Scientific Committee of Western and Central Pacific Fisheries Commission (WCPFC-SC).

### 4.4.2 CITES

- 236 The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) operates by listing endangered species on one of its three appendices. The level of protection afforded to the species depends upon which appendix, if any, a species is listed on. The listing of species on Appendix II to CITES allows commercial trade to take place accompanied by CITES export permits. Basking shark and whale shark were listed on this appendix in 2002 and great white shark was included in 2004. Subsequent to the basking shark listing taking effect, New Zealand has issued permits allowing the export of basking shark fins to Singapore from sharks taken as by-catch. Export permits have also been issued for jaws and teeth of great white sharks caught before that species was listed on CITES.
- 237 At the June 2007 meeting of the CITES Conference of the Parties, Germany, on behalf of the EU, submitted a proposal for porbeagle shark and spiny dogfish to be listed on Appendix II of CITES. New Zealand, along with a number of other countries, opposed the proposal on the basis that the species did not meet CITES criteria for listing as they have been depleted in EU waters rather than globally, and that the problem was a fisheries management issue in EU waters rather than a result of international trade. New Zealand's position was in line with the view of the FAO Ad Hoc Expert Advisory Panel which had concluded that the two species did not meet the CITES criteria for an Appendix II listing. The EU proposals ultimately fell short of obtaining a two-thirds majority.
- 238 New Zealand will continue to engage in CITES processes.

### 4.4.3 CMS

- 239 The Convention on Migratory Species (CMS) operates by listing migratory species on one of its two appendices. Appendix I lists endangered migratory species that range states are required to take measures to protect. Appendix II lists migratory species with an unfavourable conservation status that require international agreements for protection. At present the CMS lists on its appendices basking shark

(Appendix I & II), great white shark (Appendix I & II) and whale shark (Appendix II). In November 2005, New Zealand co-sponsored with Australia and the Seychelles a proposal to develop a global instrument under CMS for the improved conservation of highly migratory shark species.

- 240 A meeting was held to further this aim in December 2007 and options for international cooperation are being considered further during 2008. The application of any international agreement to new species, and whether instruments to put in place such agreements should be legally binding or voluntary, remains an issue to be resolved. It is clear that CMS parties remain concerned that internationally progress on improving the management of migratory shark species is inadequate. Those parties attending the December 2007 meeting concluded that, in addition to the development of further international instruments, greater representations by the CMS (Secretariat and parties) to Regional Fisheries Management Organisations were a key component of a strategy to achieve improved shark conservation and management.
- 241 New Zealand will continue to engage in CMS processes.

#### **4.4.4 Other international fora**

- 242 New Zealand will engage with other international fora as and when issues relating to the research and management of shark stocks are raised. For example a New Zealand delegation will attend the 2008 IUCN World Conservation Congress where motions relating to conserving migratory and oceanic sharks and a global policy on shark finning will be debated.

### **4.5 Development and implementation of Prohibited Utilisation Process Standard**

- 243 The standard will be used to identify marine species where no level of utilisation is considered to be sustainable. It has been discussed at length in Part 2 of this paper.

### **4.6 Protect basking shark**

- 244 As basking shark is listed on Appendix 1 of CMS, New Zealand has an obligation to provide protection for this species in New Zealand waters and from New Zealand vessels fishing on the High Seas. Consultation on the protection of basking shark will be initiated.

### **4.7 Ensure that fishers are aware that live shark finning constitutes ill-treatment**

- 245 The Ministry of Fisheries undertakes to ensure that the cruelty aspect of live finning is articulated clearly to all fishers operating in fisheries where shark finning takes place. Where appropriate, the Ministry of Fisheries will ensure that operational measures to ensure that sharks are not finned alive are included in Industry Codes of Conduct. These measures will ensure that in future, live-finning will constitute wilful ill-treatment of an animal and therefore be an offence both within and beyond

New Zealand's Territorial Sea.

- 246 The existing Tuna NZ code of practice for safe handling, processing and unloading of sharks dated July 2001 is included in Appendix 11.

## 4.8 Establish reporting protocol to enforce Animal Welfare Act provisions relating to live shark finning

- 247 The Animal Welfare Act is administered by the Ministry of Agriculture and Forestry (MAF). At present MAF has no established capability to monitor fishing activity to determine if live finning is taking place. The Ministry of Fisheries deploys observers across many fisheries that catch sharks and fisheries officers may also be in a position to observe this activity. The Ministry of Fisheries, in cooperation with MAF, will establish a protocol to ensure that any instances of live shark finning are dealt with appropriately.

## 4.9 Review Schedule Six provisions

### 4.9.1 *Spiny dogfish*

- 248 Provision was made to allow fishers to discard spiny dogfish both dead and alive by listing this species on the Sixth Schedule of the Fisheries Act. Fishers are required to balance all spiny dogfish catch with ACE, or pay the associated deemed value, regardless of whether this catch is landed or discarded. The reason for this provision was that, although required to land all QMS species, the costs associated with landing unwanted spiny dogfish may have been providing an incentive for fishers to discard and not report spiny dogfish catch. Without accurate reporting appropriate management settings for this fishery could not be established.
- 249 Requiring fishers to balance their catch of spiny dogfish provides some incentive for fishers to either avoid catching this species, or to offset ACE or deemed value costs by deriving some economic return from the species. The power of this incentive depends, amongst other things on, the availability of ACE, the deemed value rate, the economic value of spiny dogfish product and costs associated with a reduced ability to harvest more valuable target species (for example, by the use of limited hold space to store spiny dogfish product). Spiny dogfish are widely distributed and are both targeted and taken incidentally in a range of fisheries. As a consequence the influence of these incentives on fishers' behaviour varies by fishery. This was reflected in the divergence of opinion amongst fishers when spiny dogfish were originally considered for inclusion on the Sixth Schedule in 2004.
- 250 In the final advice to the Minister on inclusion of spiny dogfish on the Sixth Schedule MFish noted concerns raised by some submitters regarding the use of the then proposed measures over the long-term. MFish implicitly acknowledged that removal of this provision would be contemplated in future although noted that, as MFish routinely reviews the management settings for all QMS stocks, it was not necessary to set a specific timeframe for removing spiny dogfish from the Sixth Schedule. In his decision letter the Minister agreed to provide flexibility to fishers through the Sixth Schedule provisions. However he directed MFish to monitor this

fishery closely and that if this revealed that fishers were discarding spiny dogfish without reporting accurately, then the Sixth Schedule provisions would need to be re-examined or more costly monitoring programmes implemented.

- 251 MFish will review the Sixth Schedule provisions currently in place for spiny dogfish to ensure that they are appropriate.

#### **4.9.2 Other QMS species**

- 252 At the present time fishers can not lawfully release live QMS species other than those listed on the Sixth Schedule. Some in Industry consider that there is significant merit in considering Schedule 6 listing of all QMS sharks species to allow individuals to be returned if likely to survive. This would give fishers discretion to return sharks, particularly live pregnant females, pups or juveniles, for which they have no market.
- 253 MFish will review the Sixth Schedule provisions currently in place for QMS shark species to determine if additional provision could be made for the live release of other species, or particular live stages of other species.

#### **4.10 Review and revision of NPOA**

- 254 A full review and revision of the NPOA-sharks will be undertaken in 2012.

## APPENDIX 1

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### New Zealand shark fisheries

- 255 A description of New Zealand's shark fisheries and management is summarised below.

#### *Quota Management System*

- 256 There are currently 11 species managed within the QMS and these account for approximately 80% of the reported commercial take of shark species in New Zealand. Details of the reported commercial landings of QMS species are given below along with, where applicable, information regarding recreational and customary use. Reported commercial catch information for QMS species is summarised in Appendix 2.
- 257 Six species or groups of species, of sharks have dominated reported commercial landings: spiny dogfish, school shark, rough and smooth skate, ghost sharks, rig and elephant fish. These constitute approximately 85% of total reported shark landings. They are caught primarily as bycatch although target fishing does occur for some species. These species are all managed under section 13 of the Act which requires that these species are managed at or above a biomass that can support the maximum sustainable yield (MSY).
- 258 Three other species are primarily taken as bycatch in the tuna longline fisheries in New Zealand fisheries waters. These are blue shark, mako shark and porbeagle shark and are all highly migratory species. These species are managed under section 14 of the Act which allows for the setting of a catch limit other than through an assessment of MSY. Although there was no information to suggest an immediate sustainability concern for any of these three species within New Zealand fisheries waters, they were introduced into the QMS on the basis that some features of these fisheries suggested the need for active management. These issues related to regional sustainability concerns, biological characteristics of the species that make them vulnerable to overfishing, the high proportion of finning taking place and the high proportion of juvenile catch of these species within New Zealand fisheries waters.
- 259 When blue, mako and porbeagle sharks were introduced into the QMS, catch limits were set at a level of assessed bycatch to prevent an escalation in future catches. Further, while a general rule of the QMS is that all catch must be landed, in the case of pelagic sharks specific provisions were made to allow for their release, subject to them being likely to survive. This allows for the release of sharks too large to handle or too small to have a market value, thereby reducing wastage and increasing effective utilisation.
- 260 The stock status of all sharks managed within the QMS is reviewed annually, or as new information comes to hand. The stock status of the 11 QMS shark species is discussed in more detail below.



*Ghost Shark (Hydrolagus spp.)*

- 261 Two species (dark and pale ghost sharks) make up virtually all the reported commercial ghost shark landings. Dark ghost shark (*Hydrolagus novaezelandiae*) was introduced into the QMS on 1 October 1998 and pale ghost shark (*Hydrolagus* sp. B2) was introduced into the QMS on 1 October 1999.
- 262 Both ghost shark species are taken almost exclusively as a bycatch of other target trawl fisheries. In the 1990s, about 43% of ghost sharks were landed as a bycatch of the hoki fishery, with fisheries for silver warehou, arrow squid and barracouta combining to land a further 36%. The two ghost shark species were seldom differentiated on catch landing returns prior to the start of the 1998–99 fishing year. Estimated annual landings of both species by foreign licensed and joint venture vessels over the period 1 April 1978 to 30 September 1983 averaged 491 t. Reported landings by domestic (inshore) vessels would have been negligible during this time period. Since introduction into the QMS, estimated landings of dark ghost shark averaged 2034 t from the years 1999-00 to 2006-07, over which time the TAC reduced from 2963 t for the period 1998-00 to 2943 t for the period 2000-07. Reported landings for pale ghost shark averaged 1677 t in the fishing years 2000-01 to 2003-04, which significantly exceeded the TAC of 803 t. The TAC was increased to 1780 t in 2004-05 and reported landings from 2004-05 to 2006-07 averaged 796 t.
- 263 Recreational catch of both species is thought to be negligible. There is no quantitative information on Maori customary take but as for the recreational take this is likely to be very small due to the depth distribution of the species.
- 264 Several time series of relative biomass estimates are available from trawl surveys but wide fluctuations between years suggest the need for caution in using these as indicators of relative abundance although longer time series may ultimately prove useful.
- 265 No estimates of current or reference biomass are available. It is not known if recent catch levels or the current TACCs are sustainable in the long-term or whether they will allow the stocks to move towards a size that will support the maximum sustainable yield. Information from trawl surveys for pale ghost shark indicates that recent catch levels have had little impact on the biomass and there is good recruitment of small pale ghost sharks on the Chatham Rise and in the sub-Antarctic.

*School Shark (Galeorhinus galeus)*

- 266 This moderate-sized shark has supported a variety of fisheries around New Zealand from the early 1940s onwards and was introduced into the QMS on 1 Oct 1986. Reported landings rose steeply from the late 1970s until 1983 with the intensification of setnetting for this and other species, and a general decline in availability of other, previously more desirable, coastal species. However, because of earlier discarding and under-reporting, this recorded rise in reported landings does not reflect an equal rise in catches. After a small decline in 1984–85, catches decreased by about 50% from 1986 onwards because of reduced TACCs within the QMS. From 1987–88 to 1991–92 total reported landings were around 2200–2500 t. In 1995–96 total reported landings increased markedly to 3387 t and the total TACC

- (3107 t) was exceeded for the first time. Reported landings continued to exceed the TACC and the TACC was increased to 3121 t in 2001 and to 3416 in 2004.
- 267 During the period of high reported landings in the mid 1980s set netting was the main method, providing about half the total catch, with lining one-third, and trawling the remainder. There were large regional variations.
- 268 School shark are also caught by the foreign licensed fleet of tuna longliners fishing offshore in the EEZ to well beyond the shelf edge and above 4000 m bottom depths.
- 269 Although school shark is a game fish and is regularly caught by recreational fishers, it is not considered to be a particularly desirable target species. Recreational catch records have been estimated at approximately 200 t from diary surveys undertaken in 1999 and 2000. Disproportionately low numbers of tag returns from recreational fishers confirm that they are a minor source of school shark fishing mortality.
- 270 Maori fishers made extensive use of school shark in pre-European times for food, oil and skin. There is no quantitative information on the current level of Maori customary take.
- 271 School shark stocks SCH 3, SCH 5, SCH 7 and SCH 8 are all managed under the AMP framework. No estimates of current absolute biomass are available for any school shark stocks and CPUE indices are characterised by high uncertainty. While there are no indications that current catches are not sustainable in the short term it is not known whether they, or the current TACCs, are sustainable in the long-term. It is unclear whether the current TACCs will allow the stocks to move towards a size that will support the maximum sustainable yield.

### *Skates (Dipturus nasuta and Dipturus innominata)*

- 272 Two endemic species of skate, rough skate (*Dipturus nasuta*) and smooth skate (*Dipturus innominata*), are fished commercially in New Zealand and both were introduced into the QMS on 1 October 2003. Smooth skates, which are also known as barndoor skates, grow considerably larger than rough skates, but both species are landed and processed. Two other species of deepwater skate (*Bathyraja shuntovi* and *Raja hyperborea*) are large enough to be of commercial interest but are relatively uncommon and probably comprise a negligible proportion of the reported landings.
- 273 Skate flesh ammoniates rapidly after death, so the wings are removed at sea, and chilled or frozen. On arrival at the shore factories, the wings are machine-skinned, graded and packed for sale. Most of the product is exported to Europe, especially France and Italy. Skates of all sizes and of both species are processed, though some factories impose a minimum weight limit of about 1 kg (200 g per wing).
- 274 Rough and smooth skates occur throughout New Zealand, but are most abundant around the South Island in depths down to 500 m. Most of the catch is taken as bycatch by bottom trawlers, but skates are also taken by longliners. Significant longline bycatch has been reported from the Bounty Plateau. There is no clear separation of the depth ranges inhabited by the two species, and both species are

often caught in the same trawl tows; however smooth skate tend to occur slightly deeper than rough skate.

- 275 These species are taken as incidental catch in a number of bottom trawl fisheries and, as they are widely distributed, a certain level of incidental catch is considered inevitable. As skates are relatively hardy and frequently survive being caught in trawls, both species are listed on schedule 6 whereby they may be released alive.
- 276 Prior to QMS introduction many fishers and processors did not distinguished rough and smooth skates in their landing returns, and coded them instead as SKA ('skates'). Consequently it is not possible to determine the species composition of the catch from historical reported landings data.
- 277 The TACC since QMS introduction in 2003 has been 1,986 t for rough skate and 849 t for smooth skate. Annual reported landings over this period have been 1,856 t and 677 t respectively.
- 278 Recreational fishing surveys indicate that skates are very rarely caught by recreational fishers. There is no quantitative information on Maori customary take.
- 279 Relative biomass estimates are available for both species from a number of trawl survey series and this information was used to inform stock assessments for both species in 2007. No absolute current or reference biomass estimates were able to be derived from the assessment. Relative biomass estimates for QMAs 3 and 7 revealed declines of both species in recent years. It is not known if recent catch levels or the current TACs are sustainable or at levels that will allow the stock to move towards a size that will support the maximum sustainable yield.

### *Rig (Mustelus lenticulatus)*

- 280 Rig was introduced into the QMS on 1 October 1986 and is caught in coastal waters throughout New Zealand. Most of the catch is taken from water less than 50 m deep during spring and summer, when rig aggregate inshore. Before the introduction of the QMS, 80% of the commercial catch was taken by bottom set net, and most of the remainder by trawl. Since then, a larger proportion has been taken by trawlers as bycatch, but the exact split by method is unknown.
- 281 Total reported landings of rig increased rapidly during the 1970s, and averaged about 3200 t per year during the late 1970s and early 1980s.
- 282 Following introduction to the QMS, reported landings declined to less than half those of the previous decade. Since 1986–87, reported landings have generally increased in response to TAC increases although this trend has declined in recent years. The reported landings of rig in the fishing years 1998-99 to 1999-00 has averaged 1653 t at a TAC of 1888 t. The TAC was increased to 2,034 t in 2000-01 and reported landings in the fishing years 2000-01 to 2003-04 averaged 1,470 t. The TAC was further increased to 2,048 t in 2004-05 and reported landings from 2004-5 to 2005-06 averaged 1,336 t. In 2006 the TAC was decreased to 1,919 t and reported landings for the 2006-07 fishing year was 1,362 t.

- 283 Rig is caught by recreational fishers throughout New Zealand. Recreational landings between 1991 and 1994 are estimated to comprised only a small proportion (<15%) of the total rig harvest in all fishstocks. Estimates of recreational landings obtained from the 1999 and 2000 surveys estimate a catch of 86-190 t.
- 284 Māori fishers traditionally caught large numbers of ‘dogfish’ during the last century and early this century. Rig was probably an important species within the general definition of ‘dogfish’, although spiny dogfish and school shark were probably also included under this general terminology. The early practice of having regular annual fishing expeditions, during which thousands of dogfish were sun-dried on wooden frames, has died out. However, rig is still caught in small quantities by Māori in parts of the North Island, especially the harbours of the Auckland region. Quantitative information on the current level of Māori customary take is not available.
- 285 A fisheries plan has been developed for the management of Rig in Quota Management Area 7 (SPO 7). This plan was formally approved by the Minister of Fisheries in mid 2006. The SPO 3 stock is being managed within the AMP framework.
- 286 No estimates of current and reference biomass are available for rig stocks. For SPO 1, reported landings have generally declined since 1991–92. This decline may be partially due to quota distribution problems. Patterns in relative abundance suggest that recent catch levels are probably sustainable. However, it is unknown whether the current TACC is sustainable, or whether the recent catch levels and the current TACC are at levels that will allow the stock to move towards a size that would support the maximum sustainable yield.
- 287 For SPO 2, reported landings have exceeded the TACC every year since 1991–92. In 1997, agreement could not be reached on whether recent catch levels or the current TACC are sustainable. It is not known whether recent catches and the current TACC are at levels that will allow the stock to move towards a size that would support the maximum sustainable yield.
- 288 SPO 3 is being managed within an AMP (the TACC was increased to 600 t in 2000–01) with a decision rule relating to CPUE. Recent catch levels and the current TACC are thought to be sustainable, but it is unknown if they are at levels that will allow the stock to move towards a size that would support the maximum sustainable yield.
- 289 SPO 7 is being managed within a stakeholder lead fisheries plan and prior to that it was managed within an AMP. In 2006 the AMP FAWG concluded, based on a stock assessment, that SPO7 was below  $B_{MSY}$  and that neither current catches nor the TACC were sustainable. Based on this assessment the TACC was reduced in 2006–07.
- 290 For SPO 8, reported landings increased until 1995–96 and then have declined steadily; the current catch was 216 t in 2001–02. All recorded landings have been less than the TACC. Recent catch levels are probably sustainable. However, it is unknown whether the current TACC is sustainable, or whether the recent catch

levels and the current TACC are at levels that will allow the stock to move towards a size that would support the maximum sustainable yield.

### *Elephant Fish (Callorhinchus milii)*

- 291 From the 1950s to the 1980s, reported landings of elephant fish of around 1000 t were not uncommon. By contrast, reported landings from 1982–83 to 1994–95 were generally lower (between 500 and 700 t). This species was introduced into the QMS on 1 October 1986 and initial catches were 500-600 t. However, since 1995–96 total reported landings of elephant fish have increased markedly, and reported landings in 2000–01 (1207 t at a TACC of 1040t) were the highest since 1964, in 2001–02, they decreased slightly to 1052 t at a TACC of 1057 t.
- 292 Targeted set netting of elephant fish decreased since introduction to the QMS. Most of the recent increase in catch from the fishery has been taken as a bycatch of the red cod trawl fishery. During the 1989–90 to 1997–98 period, the level of elephant fish bycatch from the red cod fishery increased from around 50 t to 300 t. There was also a steady increase in the level of elephant fish bycatch from the flatfish trawl fishery, with catches increasing from around 50 t in 1994–95 to 150 t in 1997–98.
- 293 Catches of elephant fish by recreational fishers are low compared to those of the commercial sector. Three recreational fishing surveys carried out by the Ministry of Fisheries suggest that recreational catch is somewhere in the region of 2000 - 4000 fish. Quantitative information on the current level of Maori customary take is not available.
- 294 ELE 3 and ELE 5 stocks are managed under the AMP framework.
- 295 Indices of relative abundance are available from trawl surveys but these have not been used to estimate absolute abundance as they are not considered to have monitored the biomass of elephant fish very well.
- 296 It is not known if recent catch levels or the current TACC for ELE 2 are sustainable, or if they are at levels that will allow the stock to move towards a size that will support the maximum sustainable yield.
- 297 ELE 3 is currently being managed within an AMP that is monitoring a CPUE index derived from reported elephantfish landings in the red cod bottom trawl fishery. Before the introduction of the QMS, elephantfish off the south east coast of the South Island were considered severely overfished, and TACs were initially set at low levels to facilitate stock recovery. Based on the observed catches, and on the increasing biomass trend from the CPUE analysis, it now appears that this stock has rebuilt considerably since the mid-1980s. The TACC for ELE 3 was increased to 950 t for the 2002–03 fishing year under the AMP. Recent catch levels substantially exceeded the TACC and the MCY; but the MCY estimate is probably conservative. It cannot be determined if the current TACC of 950 t is sustainable in the long-term or if it will allow the stock to move towards the size that will support the maximum sustainable yield.
- 298 Before the introduction of the QMS, elephantfish in Southland were considered severely overfished, and TACs were initially set at low levels to facilitate stock

recovery. ELE 5 is managed under the AMP framework. The TACC was increased twice within the AMP - first to 100 t in October 2001 and then to 120 t in October 2004 - as there was a reasonable probability that the stock was above the size that would support the MSY. However, it is not known if recent catch levels and current TACCs are sustainable or if they are at levels that will allow the stocks to move towards a size that will support the MSY.

- 299 In ELE 7 catches since 1987–88 have been above the MCY and below the TAC. It is not known if recent catch levels and current TACCs are sustainable or if they are at levels that will allow the stocks to move towards a size that will support the MSY.

### *Blue Shark (Prionace glauca)*

- 300 Blue shark is highly migratory and is found over a wide portion of the Pacific Ocean, and possibly even including the North Pacific and Indian Oceans. The degree to which populations are resident in New Zealand waters is not known. As yet there are no specific international obligations with regard to the management of this species.
- 301 Blue shark is caught commercially as a bycatch by tuna longliners. There are no target fisheries for blue shark in New Zealand, but the choice of fishing gear can influence the retention of sharks once caught through the use of steel traces. Blue shark is listed on schedule 6 which allows fishers to return them if the shark is likely to survive.
- 302 Blue shark are managed under s 14 of the Act as they are a highly migratory species and it is therefore not possible to estimate MSY for the part of the stock found in New Zealand. The TAC for blue shark is 2080 t with 1860 t of this being allocated to the commercial sector. An allowance of 190 t is provided for other sources of fishing related mortality.
- 303 There are issues associated with the predominant harvest of immature blue shark in the New Zealand fishery. A balance was required between not providing for the development of a target fishery and imposing unreasonable constraint on fishers particularly during a period of rationalisation of the tuna longline fishery. In the absence of information to undertake an assessment of the potential yield of blue shark, the TAC was based on estimates of current utilisation immediately prior to introduction into the QMS. Estimates of utilisation were based on the best available information, including that contained in submissions.
- 304 Although not highly regarded as a game fish, blue sharks are caught in relatively large number by game fishers, particularly in southern New Zealand where they are the primary target. Each year several hundred individuals are routinely tagged and released (2,689 between 1994 and 2004) although the total recreational catch is unknown. The annual recreational allowance is 20 t.
- 305 There is no indication of the importance of blue shark to customary Māori fisheries. However, sharks in general are known to be important and within that category there must be a take of blue shark. An allowance of 10 t is provided to account for customary take.

*Mako Shark (Isurus oxyrinchus)*

- 306 This species is highly migratory and is found over a wide portion of the Pacific Ocean. The degree to which populations are resident in New Zealand waters is not known but those in New Zealand waters are thought to be part of a single biological stock that probably ranges as far as Australia to the west and possibly as far as French Polynesia to the east. As yet there are no specific international obligations with regard to the management of this species.
- 307 Mako shark is an unavoidable bycatch in tuna longline fisheries, trawl and bottom longline fisheries. There are no target fisheries for mako shark in New Zealand, but in the longline fisheries the choice of fishing gear can influence the retention of sharks once caught through the use of steel traces. In New Zealand, mako shark recruits to commercial fisheries during their first year, and much of the commercial catch is immature.
- 308 The TAC is set under section 14. In the absence of information to undertake an assessment of the potential yield of mako shark, the TAC was based on estimates of current utilisation immediately prior to introduction into the QMS. Estimates of utilisation was based on the best available information, including that contained in submissions.
- 309 The TAC for mako shark is 512 t with 406 t of this being allocated to the commercial sector. An allowance of 46 t is provided for other sources of fishing related mortality.
- 310 There is a significant recreational catch of mako shark and it is highly prized as a game fish. Several hundred mako sharks per year are reported landed by big game fishing clubs, but many more are tagged and released (6963 between 1993 and 2004), or caught by fishers not belonging to one of these clubs. The New Zealand Big Game Fishing Council (NZBGFC) contends that club records indicate a disturbing trend in the recreational catch of mako shark, total reports dropping in 2000-01 to one quarter of the total reports in 1994-95. This is most notable in the number of mako sharks tagged and released, especially in the 20-60 kg weight range. NZBGFC submits that the commercial tuna long line fishery has had an adverse effect on the recreational catch of mako shark, particularly in the Gisborne and Napier areas. The annual recreational allowance is 20 t.
- 311 There is no indication of the importance of mako shark to customary Māori fisheries. However, sharks in general are known to be important and within that category there must be a take of mako shark. An allowance of 10 t is provided to account for customary take.

*Porbeagle Shark (Lamna nasus)*

- 312 Porbeagle sharks are distributed from sub-Antarctic to temperate waters. Those found around New Zealand are probably a single stock that ranges as far as Australia, the sub-Antarctic Islands and the Indian Ocean. As yet there are no specific international obligations with regard to the management of this species.
- 313 Porbeagle shark is an unavoidable bycatch in trawl and longline fisheries. There are no target fisheries for porbeagle shark in New Zealand, but in the longline fisheries

the choice of fishing gear can influence the retention of sharks. Catch is maximised using steel traces but the majority of fishers now use nylon traces.

- 314 The TAC is set under section 14. In the absence of information to undertake an assessment of the potential yield of mako shark, the TAC was based on estimates of current utilisation immediately prior to introduction into the QMS. Estimates of utilisation was based on the best available information, including that contained in submissions.
- 315 The TAC for porbeagle shark is 249 t with 215 t of this being allocated to the commercial sector. The majority of catch is taken in the surface longline fishery, but substantial amounts are also taken by midwater trawl, mostly the hoki fishery off the north-west South Island and the southern blue whiting fishery around the Auckland Islands. An allowance of 22 t is provided for other sources of fishing-related mortality.
- 316 There is a recreational catch of porbeagle shark which is recognised as a game fish. Between 1994 and 2004, 114 porbeagle sharks were reported tagged and released by big game fishing clubs. The annual recreational allowance is 10 t.
- 317 There is no indication of the importance of porbeagle shark to customary Māori fisheries, however, shark in general is known to be important and within that category there must be a take of porbeagle shark. An allowance of two t is provided to account for customary take.

### *Spiny Dogfish (Squalus acanthias)*

- 318 Reported catch of spiny dogfish by the inshore fleet has shown a steady increase and is now at a similar level to the catch from the deepwater fleet. Most of the spiny dogfish caught by the deepwater fleet are taken as a bycatch in the jack mackerel, barracouta, hoki, red cod, and arrow squid fisheries, in depths from 100 to 500 m. Some are packed whole but most are trunked and exported to markets in Asia and Europe.
- 319 Spiny dogfish are also taken as bycatch by inshore trawlers, set netters and longliners targeting flatfish, snapper, tarakihi and gurnard. Processing problems due to their spines, sandpaper-like skin, short shelf life, and their low economic value mean that many inshore fishers are not interested in processing and landing this species. Furthermore, because of their sheer abundance they can at times severely hamper fishing operations for other commercial species and they are regarded by many fishers as a major nuisance. Trawlers working off Otago during the summer months often reduce towing times and headline heights, and at times leave the area altogether to avoid having to spend hours pulling hundreds of meshed dogfish out of trawl nets. Set netters and longliners off the Otago coast, and in Tasman Bay and the south Taranaki Bight have also complained about spiny dogfish taking longline baits, attacking commercial fish caught in the nets or lines, and rolling up nets.
- 320 Although discard rates increased dramatically through the 1990s, this is believed to reflect a change in reporting practise rather than an increase in the proportion of catch discarded. Reported landings from the fishing years 1998-99 to 2002-03 have averaged 9006 t, however, as spiny dogfish were not managed within the QMS until



the 2004-05 fishing year, they could be legally discarded at sea (provided that total catch was reported). Since introduction of spiny dogfish into the QMS catches have ranged from 7,200 to 8,300 t of which between 55 and 70% are reportedly discarded at sea.

- 321 Spiny dogfish are caught by recreational fishers throughout their geographical range in New Zealand. They are mainly taken as bycatch when targeting other more valued species. In many parts of New Zealand spiny dogfish are regarded by recreational anglers as a pest, often clogging nets and taking baits from hooks. An estimate of recreational landings of approximately 6000 t was obtained from a survey in 1999-2000.

### ***Protected species***

- 322 Sharks that are not managed in the QMS can be subject to individual conservation actions. In response to global concerns over the conservation status of great white sharks, New Zealand prohibited the taking of the species within the New Zealand Territorial Sea and EEZ from 1 April 2007. The taking of great white shark by New Zealand vessels on the High Seas was also prohibited at this time. Commercial catch information for great white shark is summarised in Appendix 2.
- 323 Whale shark is currently being considered for protection under the Wildlife Act 1953 due to its listing on Appendix 2 of both CMS and CITES. Three other shark and ray species are also being considered for protection under the Wildlife Act as part of the review of the schedules of that Act. The species are the deepwater nurse shark and two species of manta ray.
- 324 A further group of shark species (basking shark, hammerhead shark, sharpnose sevengill shark and whale shark), have been listed on Schedule 4C to the Fisheries Act. For species listed on this schedule a moratorium is in place on the issuing of commercial fishing permits and without a permit these species cannot be targeted. These four shark species will therefore remain as non-QMS bycatch species until such time as a decision is made to add them to the QMS or apply an alternative management framework.

### ***Non-QMS shark species***

- 325 Fishers are required to report the catch of all non-QMS species when furnishing their monthly returns. As a result, the commercial reporting requirements provide information on total catch and effort of all sharks caught in New Zealand fisheries.
- 326 There are four shark species listed on Schedule 4C to the Act and another 60 or so non-QMS species which are taken in various quantities by commercial fishers. Reported commercial catch information for non-QMS species is summarised in Appendix 2. Less than 1% of the commercial shark catch was provided by species listed on Schedule 4C, with the remaining open access species accounting for approximately 12%.

***Generic codes***

- 327 There are a number of generic codes for shark species to allow fishers to record catch of species that they cannot distinguish. Commercial catch information reported against these generic codes for the last 5 fishing years is summarised in Appendix 3.
- 328 Over this period approximately 3-9 % of the total commercial shark catch was recorded against generic codes.

## APPENDIX 2

### *Reported commercial catch of sharks (2002-2007)*

### *Reported commercial catch of great white shark<sup>40</sup> (2002-2007)*

Common Name	Species code	2002/03		2003/04		2004/05		2005/06		2006/07	
		Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch
Great white shark	WPS	48	0.00%	3840	0.02%	845	0.00%	2485	0.01%	791	0.00%
<b>Catch of protected species as a percentage of total annual reported shark catch</b>			<b>0.00%</b>		<b>0.02%</b>		<b>0.00%</b>		<b>0.01%</b>		<b>0.00%</b>

<sup>40</sup> Great white sharks are protected from 1 April 2007. Note that there are particular problems with WPS data including misreporting fin weights as greenweight and non-reporting (see International trade in white shark products from New Zealand in Shark News 16 Newsletter of the IUCN shark specialist group October 2004). Data for 2001-02 is from that report.

*Reported commercial catch of QMS shark species (2002-2007)*

*QMS shark species managed under section 13*

Common Name	Species code	2002/03		2003/04		2004/05		2005/06		2006/07	
		Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch
Elephant fish	ELE	1124476.4	3.88%	1126658.5	4.48%	1180444.1	5.18%	1259551.8	5.71%	1252660.7	5.66%
Ghost shark	GSH	2557218	8.82%	1966498.2	7.81%	2112660.9	9.27%	1718001.2	7.79%	1974258.5	8.93%
Pale ghost shark	GSP	1943659.8	6.71%	1574615.4	6.26%	942669.94	4.14%	689683.06	3.13%	770250.4	3.48%
Rig	SPO	1525680.8	5.26%	1472578	5.85%	1410156.5	6.19%	1310210.6	5.94%	1405303.1	6.36%
Rough skate	RSK	1147145.8	3.96%	1872220	7.44%	2135136.5	9.37%	1743208.4	7.90%	1806628.8	8.17%
School shark	SCH	3212083.2	11.08%	3108942.6	12.35%	3418127.6	15.00%	3048209.4	13.82%	3185142.9	14.40%
Smooth skate	SSK	914690.45	3.16%	683402.64	2.72%	643690.43	2.82%	705201.96	3.20%	686994.28	3.11%
Spiny dogfish	SPD	10703541	36.93%	9165430.7	36.41%	7498516.9	32.90%	8209203	37.21%	7502985.8	33.93%
<b>Reported catch of species managed under s 13 as a percentage of total annual shark catch</b>			<b>79.79%</b>		<b>83.32%</b>		<b>84.86%</b>		<b>84.68%</b>		<b>84.04%</b>

## QMS shark species managed under section 14

Common Name	Species code	2002/03		2003/04		2004/05		2005/06		2006/07	
		Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch
Blue shark	BWS	908239.93	3.13%	752203.35	2.99%	757125.25	3.32%	669301.65	3.03%	840979.18	3.80%
Mako shark	MAK	232460.29	0.80%	113148.95	0.45%	167395.65	0.73%	86199.21	0.39%	84785.96	0.38%
Porbeagle shark	POS	152121.45	0.52%	83727.96	0.33%	61935.5	0.27%	53998.94	0.24%	59497.33	0.27%
<b>Reported catch of QMS species managed under s 14 as a percentage of total annual shark catch</b>			<b>4.46%</b>		<b>3.77%</b>		<b>4.33%</b>		<b>3.67%</b>		<b>4.46%</b>

*Reported commercial catch of non-QMS shark species (2002-2007)*

*Shark species listed on Schedule 4C*

Common Name	Species code	2002/03		2003/04		2004/05		2005/06		2006/07	
		Reported catch (greenweight kg)	Percentage of reported annual shark catch	Reported catch (greenweight kg)	Percentage of reported annual shark catch	Reported catch (greenweight kg)	Percentage of reported annual shark catch	Reported catch (greenweight kg)	Percentage of reported annual shark catch	Reported catch (greenweight kg)	Percentage of reported annual shark catch
Basking shark	BSK	181256.25	0.63%	195913.3	0.78%	93593.92	0.41%	25570.4	0.12%	29313.5	0.13%
Hammerhead shark	HHS	12316.8	0.04%	11174.2	0.04%	7136.12	0.03%	8280.09	0.04%	6128.3	0.03%
Sharnose sevengill shark	HEP	118	0.00%	293.5	0.00%	75.5	0.00%	1429.55	0.01%	622	0.00%
Whale shark		0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
<b>Reported catch of 4C species as a percentage of total annual shark catch</b>			<b>0.67%</b>		<b>0.82%</b>		<b>0.44%</b>		<b>0.16%</b>		<b>0.16%</b>

## Open access shark species

Common Name	Species code	2002/03		2003/04		2004/05		2005/06		2006/07	
		Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch
Amblyraja georgiana	SRR	586.36	0.00%	3630.22	0.01%	1546.2	0.01%	947.46	0.00%	1075.9	0.00%
Baxter's lantern dogfish	ETB	19407	0.07%	24564	0.10%	12796	0.06%	21803	0.10%	46177.8	0.21%
Bigeye thresher	BET	0	0.00%	241	0.00%	0	0.00%	257	0.00%	559	0.00%
Black ghost shark	HYB	30	0.00%	0	0.00%	1164	0.01%	0	0.00%	0	0.00%
Blackbelly lantern shark	EMO	0	0.00%	0	0.00%	0	0.00%	0	0.00%	81	0.00%
Bramble shark	BRS	15	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Broadnose sevengill shark	SEV	5216.36	0.02%	3193.93	0.01%	3845.8	0.02%	3951	0.02%	8891.62	0.04%
Bronze whaler shark	BWH	27528.45	0.09%	28863.31	0.11%	16422.56	0.07%	14425.92	0.07%	20050.91	0.09%
Carpet shark	CAR	73588.86	0.25%	102641.02	0.41%	127268.74	0.56%	177963.14	0.81%	245354.91	1.11%
Cat shark	APR, CSH	8314	0.03%	3776.6	0.02%	286	0.00%	49	0.00%	442	0.00%
Chimaera spp.	CHI	846	0.00%	470	0.00%	248	0.00%	302	0.00%	330	0.00%
Chimaera, purple	CHP	185.24	0.00%	441	0.00%	161.2	0.00%	898	0.00%	629.6	0.00%
Dawson's cat shark	DCS	23.53	0.00%	23.15	0.00%	0	0.00%	0	0.00%		0.00%
Deepsea skates	BTH	0	0.00%	0	0.00%	2.13	0.00%	62.19	0.00%	342	0.00%
Deepwater dogfish (Unspecified)	DWD	252604.06	0.87%	267785.24	1.06%	246380.41	1.08%	204236.01	0.93%	127220.8	0.58%
Deepwater spiny skate	DSK	452	0.00%	5962.5	0.02%	6472.66	0.03%	2912.2	0.01%	5548.1	0.03%
Eagle ray	EGR	19782.07	0.07%	44577	0.18%	48354.98	0.21%	47324.94	0.21%	67188.71	0.30%
Eaton's skate	BEA	140	0.00%	103.17	0.00%	192	0.00%	53.2	0.00%	24.2	0.00%
Electric ray	BER, ERA	22981.65	0.08%	32593.31	0.13%	24914.13	0.11%	26920.66	0.12%	32158.23	0.15%
Etmopterus pusillus	ETP	0	0.00%	150	0.00%	0	0.00%	0	0.00%	0	0.00%
Etmopterus spp.	ETN	0	0.00%	395	0.00%	177	0.00%	1309	0.01%	276	0.00%
Frill shark	FRS	8	0.00%	14.2	0.00%	0	0.00%	0	0.00%	3	0.00%
Giant black ghost shark	HGB	910	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Leafscale gulper shark	CSQ	1624	0.01%	2715	0.01%	157	0.00%	2894.2	0.01%	2120	0.01%

Common Name	Species code	2002/03		2003/04		2004/05		2005/06		2006/07	
		Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch
Little sleeper shark	SOM	0	0.00%	33	0.00%	0	0.00%	0	0.00%	0	0.00%
Longnose velvet dogfish	CYP	5118	0.02%	939	0.00%	131	0.00%	280	0.00%	339	0.00%
Long-nosed chimaera	LCH	195168.74	0.67%	197113.48	0.78%	166665.97	0.73%	133198.21	0.60%	115207.95	0.52%
Longnosed deepsea skate	PSK	81	0.00%	987.1	0.00%	22	0.00%	841	0.00%	9803	0.04%
Long-tailed skate	LSK	864	0.00%	773	0.00%	436	0.00%	4458	0.02%	3120	0.01%
Lucifer dogfish	ETL	7138.22	0.02%	9655.6	0.04%	3247.35	0.01%	3159.31	0.01%	10366.59	0.05%
Manta ray	MJA	0	0.00%	0	0.00%	1032.5	0.00%	40	0.00%	4455	0.02%
Northern spiny dogfish	NSD	101747.12	0.35%	86146.47	0.34%	45461.72	0.20%	113922.85	0.52%	123873.66	0.56%
Notoraja spinifera	BTS	0	0.00%	1	0.00%	0	0.00%	0	0.00%	0	0.00%
Oval electric ray	TTA	0	0.00%	0	0.00%	0	0.00%	0	0.00%	25	0.00%
Pacific sleeper shark	SOP	0	0.00%	0	0.00%	0	0.00%	1500	0.01%	10.5	0.00%
Pelagic stingray	DAS	395	0.00%	105	0.00%	0	0.00%	95	0.00%	29	0.00%
Plunket's shark	PLS	105	0.00%	116	0.00%	0	0.00%	164	0.00%	979	0.00%
Pointynose blue ghost shark	HYP	0	0.00%	1473	0.01%	286	0.00%	0	0.00%	0	0.00%
Potuguese dogfish	CYL	2352	0.01%	651	0.00%	394	0.00%	857.9	0.00%	803.6	0.00%
Prickly dogfish	PDG	3208.03	0.01%	5190.31	0.02%	2158.14	0.01%	1936.17	0.01%	11835.5	0.05%
Prickly shark	ECO	91	0.00%	7	0.00%	5	0.00%	967.15	0.00%	2.3	0.00%
Purple chimaera	CHG	8833.42	0.03%	2104	0.01%	2592.8	0.01%	1373.7	0.01%	6249.2	0.03%
Rays	RAY	31799.4	0.11%	1868	0.01%	3510	0.02%	1022	0.00%	1266.25	0.01%
Rough shovelnose dogfish	SNR	0	0.00%	416	0.00%	640	0.00%	0	0.00%	0	0.00%
Roughskin dogfish	SCM	1845	0.01%	2290	0.01%	427.2	0.00%	1013.4	0.00%	1837	0.01%
Sand shark	ODO	400	0.00%	155	0.00%	261.8	0.00%	1301	0.01%	727.9	0.00%
Seal shark	BSH	804502.23	2.78%	729072.8	2.90%	716805.08	3.14%	633875.33	2.87%	495498.31	2.24%
Shark (Unspecified)	SHA	3558.6	0.01%	0	0.00%	0	0.00%	0	0.00%	130	0.00%
Other sharks & dogfish	OSD	1111652.8	3.84%	1013930.3	4.03%	541071.13	2.37%	702194.14	3.18%	797385.63	3.61%
Short-tailed black ray	BRA	15805	0.05%	22029	0.09%	16961.3	0.07%	10953.8	0.05%	12513.8	0.06%
Shovelnose dogfish	SND	260395.81	0.90%	332012.91	1.32%	292838.08	1.28%	333038.75	1.51%	253064.95	1.14%
Sixgill shark	HEX	860	0.00%	52	0.00%	115	0.00%	451.8	0.00%	276	0.00%



Common Name	Species code	2002/03		2003/04		2004/05		2005/06		2006/07	
		Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch	Reported catch (greenweight kg)	Percentage of annual reported shark catch
Skate, Other	OSK	0	0.00%	110	0.00%	148	0.00%	2718.5	0.01%	3265	0.01%
Skates	SKA	1261457.3	4.35%	16791.09	0.07%	0	0.00%	0	0.00%	0	0.00%
Slender smooth-hound	SSH	5552.4	0.02%	8757	0.03%	9189.93	0.04%	10846	0.05%	5172.8	0.02%
Smooth skin dogfish	CYO	2247	0.01%	3542	0.01%	1139	0.00%	2889	0.01%	2490	0.01%
Somniosus microcephalus	SMI	0	0.00%	0	0.00%	0	0.00%	0	0.00%	500	0.00%
Stingray (Unspecified)	STR	19027.62	0.07%	2381.59	0.01%	5193.8	0.02%	11882.32	0.05%	17477.8	0.08%
Thresher shark	THR	89979.48	0.31%	64741.75	0.26%	44971.52	0.20%	35094.78	0.16%	43913.62	0.20%
Tiger shark	TIS	416	0.00%	0	0.00%	2.4	0.00%	0	0.00%	0	0.00%
Velvet dogfish	ZAS	0	0.00%	0	0.00%	0	0.00%	69	0.00%	0	0.00%
Whiptail ray	WRA	2486.3	0.01%	13053.5	0.05%	16520.4	0.07%	14981.7	0.07%	24416	0.11%
Widenosed chimaera	RCH	175	0.00%	365	0.00%	804	0.00%	744	0.00%	1375	0.01%
<b>Reported catch of open access species as a percentage of total annual shark catch</b>			<b>15.08%</b>		<b>12.07%</b>		<b>10.37%</b>		<b>11.48%</b>		<b>11.34%</b>

## APPENDIX 3

### *Reported commercial catch of Shark species recorded under generic codes (2002-2007)*

Common Name	Species code	2002/03		2003/04		2004/05		2005/06		2006/07	
		Reported catch (greenweight kg)	Percentage of reported annual shark catch	Reported catch (greenweight kg)	Percentage of reported annual shark catch	Reported catch (greenweight kg)	Percentage of reported annual shark catch	Reported catch (greenweight kg)	Percentage of reported annual shark catch	Reported catch (greenweight kg)	Percentage of reported annual shark catch
Chimaera spp.	CHI	846	0.00%	470	0.00%	248	0.00%	302	0.00%	330	0.00%
Deepwater dogfish (Unspecified)	DWD	252604.06	0.87%	267785.24	1.06%	246380.41	1.08%	204236.01	0.93%	127220.8	0.58%
Rays	RAY	31799.4	0.11%	1868	0.01%	3510	0.02%	1022	0.00%	1266.25	0.01%
Shark (Unspecified)	SHA	3558.6	0.01%	0	0.00%	0	0.00%	0	0.00%	130	0.00%
Other sharks & dogfish	OSD	1111652.8	3.84%	1013930.3	4.03%	541071.13	2.37%	702194.14	3.18%	797385.63	3.61%
Skate, Other	OSK	0	0.00%	110	0.00%	148	0.00%	2718.5	0.01%	3265	0.01%
Skates	SKA	1261457.3	4.35%	16791.09	0.07%	0	0.00%	0	0.00%	0	0.00%
<b>Reported catch recorded under generic codes as a percentage of total annual shark catch</b>			<b>9.18%</b>		<b>5.17%</b>		<b>3.47%</b>		<b>4.13%</b>		<b>4.20%</b>

## APPENDIX 4

### *Percentage of reported commercial catch of all sharks by landed state (2002-2007)*

<b>Common name</b>	<b>Percentage discarded</b>	<b>Percentage landed</b>	<b>Percentage released alive</b>	<b>Percentage used onboard</b>
Amblyraja georgiana	39.65%	60.35%	0.00%	0.00%
Basking shark	69.05%	30.95%	0.00%	0.00%
Baxter's lantern dogfish	52.65%	47.35%	0.00%	0.00%
Bigeye thresher	22.80%	77.20%	0.00%	0.00%
Black ghost shark	100.00%	0.00%	0.00%	0.00%
Blackbelly lantern shark	98.77%	1.23%	0.00%	0.00%
Blue shark	5.50%	93.59%	0.87%	0.04%
Bramble shark	100.00%	0.00%	0.00%	0.00%
Broadnose sevengill shark	15.33%	84.11%	0.24%	0.32%
Bronze whaler shark	8.98%	90.95%	0.00%	0.07%
Carpet shark	72.19%	27.71%	0.00%	0.11%
Cat shark	97.32%	2.68%	0.00%	0.00%
Chimaera spp.	61.48%	38.52%	0.00%	0.00%
Chimaera, purple	45.05%	54.95%	0.00%	0.00%
Dawson's cat shark	100.00%	0.00%	0.00%	0.00%
Deepsea skates	85.65%	14.35%	0.00%	0.00%
Deepwater dogfish	94.41%	5.17%	0.00%	0.42%
Deepwater spiny skate	84.56%	15.44%	0.00%	0.00%
Eagle ray	45.79%	54.06%	0.00%	0.16%
Eaton's skate	1.76%	98.24%	0.00%	0.00%
Electric ray	87.80%	11.98%	0.00%	0.22%
Elephant fish	0.01%	99.97%	0.00%	0.02%
Etmopterus pusillus	100.00%	0.00%	0.00%	0.00%
Etmopterus spp.	100.00%	0.00%	0.00%	0.00%
Frill shark	0.00%	100.00%	0.00%	0.00%

Common name	Percentage discarded	Percentage landed	Percentage released alive	Percentage used onboard
Ghost shark	0.36%	99.59%	0.00%	0.05%
Giant black ghost shark	100.00%	0.00%	0.00%	0.00%
Hammerhead shark	5.01%	94.70%	0.00%	0.29%
Leafscale gulper shark	30.67%	69.33%	0.00%	0.00%
Little sleeper shark	0.00%	100.00%	0.00%	0.00%
Longnose velvet dogfish	19.10%	80.90%	0.00%	0.00%
Long-nosed chimaera	13.82%	86.18%	0.00%	0.00%
Longnosed deepsea skate	86.81%	13.19%	0.00%	0.00%
Long-tailed skate	99.60%	0.40%	0.00%	0.00%
Lucifer dogfish	95.22%	4.78%	0.00%	0.00%
Mako shark	4.49%	94.98%	0.21%	0.33%
Manta ray	99.77%	0.23%	0.00%	0.00%
Northern spiny dogfish	32.04%	67.90%	0.00%	0.06%
Notoraja spinifera	0.00%	100.00%	0.00%	0.00%
Oval electric ray	100.00%	0.00%	0.00%	0.00%
Pacific sleeper shark	99.30%	0.70%	0.00%	0.00%
Pale ghost shark	0.17%	99.79%	0.00%	0.04%
Pelagic stingray	96.47%	3.53%	0.00%	0.00%
Plunket's shark	91.20%	8.80%	0.00%	0.00%
Pointynose blue ghost shark	100.00%	0.00%	0.00%	0.00%
Porbeagle shark	18.47%	79.92%	0.81%	0.80%
Potuguese dogfish	12.11%	87.89%	0.00%	0.00%
Prickly dogfish	99.24%	0.71%	0.00%	0.05%
Prickly shark	8.95%	91.05%	0.00%	0.00%
Purple chimaera	40.54%	59.40%	0.00%	0.06%
Rays	44.00%	56.00%	0.00%	0.00%
Rig	0.65%	99.33%	0.00%	0.02%
Rough shovelnose dogfish	96.21%	3.79%	0.00%	0.00%
Rough skate	2.49%	97.32%	0.11%	0.07%
Roughskin dogfish	6.52%	93.48%	0.00%	0.00%
Sand shark	65.36%	34.64%	0.00%	0.00%

Common name	Percentage discarded	Percentage landed	Percentage released alive	Percentage used onboard
School shark	0.10%	99.85%	0.00%	0.05%
Seal shark	35.15%	64.34%	0.00%	0.52%
Shark (Unspecified)	3.52%	96.48%	0.00%	0.00%
Other sharks & dogfish	67.98%	31.89%	0.00%	0.12%
Sharpenose sevengill shark	76.95%	23.05%	0.00%	0.00%
Short-tailed black ray	93.12%	6.88%	0.00%	0.00%
Shovelnose dogfish	64.68%	34.54%	0.00%	0.78%
Sixgill shark	88.96%	11.04%	0.00%	0.00%
Skate, Other	95.35%	4.65%	0.00%	0.00%
Skates	23.85%	76.15%	0.00%	0.00%
Slender smooth-hound	67.17%	32.83%	0.00%	0.00%
Smooth skate	2.15%	97.63%	0.02%	0.20%
Smooth skin dogfish	56.31%	43.69%	0.00%	0.00%
Somniosus microcephalus	100.00%	0.00%	0.00%	0.00%
Spiny dogfish	56.79%	43.15%	0.00%	0.06%
Stingray (Unspecified)	76.85%	23.15%	0.00%	0.00%
Thresher shark	28.49%	71.35%	0.00%	0.16%
Tiger shark	0.00%	100.00%	0.00%	0.00%
Velvet dogfish	100.00%	0.00%	0.00%	0.00%
Whiptail ray	85.70%	14.06%	0.00%	0.24%
White pointer shark	35.46%	64.54%	0.00%	0.00%
Widenosed chimaera	100.00%	0.00%	0.00%	0.00%
<b>Total</b>	<b>27.60%</b>	<b>72.27%</b>	<b>0.04%</b>	<b>0.09%</b>

Where:

Discarded includes destination type codes A, D, H, and M

Landed includes destination type codes L, F, O, S, W

Used on board includes destination type codes B, E, U

Released alive includes destination type code X

## APPENDIX 5

*Percentage of total reported catch of shark species listed on Schedule 6 reported against each destination code for the 2006-07 fishing year.<sup>41</sup>*

Destination type code	Description of code	Shark species listed on Schedule 6				
		Blue shark	Mako shark	Porbeagle shark	Rough skate	Smooth skate
A	QMS species returned to, abandoned or accidentally lost at sea	0.37%	0.88%	3.48%	0.30%	0.97%
D	Non-QMS species returned to, abandoned or accidentally lost at sea	0.34%	0.05%	0.47%	0.01%	0.19%
E	Eaten onboard	0.07%	0.61%	1.94%	0.08%	0.24%
L	Landed	95.16%	96.68%	85.19%	99.07%	98.46%
O	Transported outside EEZ	0.00%	0.00%	3.33%	0.00%	0.01%
U	Bait	0.00%	0.05%	0.00%	0.00%	0.00%
W	Wharf sales	0.00%	0.00%	0.00%	0.01%	0.00%
X	Returned to the water	4.06%	1.73%	5.59%	0.53%	0.13%

<sup>41</sup> This was the first year that destination code X was available to fishers. It appears from comparison with observer data and information reported on the Tuna Longlining Catch Effort Return that the percentage of catch released alive may be significantly higher than that reported against destination type code X, and that a small percentage of the catch is discarded dead. Observer reports show that 31% of blue shark, 29% of mako shark and 18% of porbeagle shark observed catch was returned to the sea alive in 2006-07; and 2% of blue shark catch, 5% of mako shark and 4% of porbeagle observed catch was discarded dead. Information reported on the Tuna Longlining Catch Effort Return shows that 33% of Blue shark, 34% of Mako shark and 22% of Porbeagle shark catch was returned to the sea in 2006-07.

## APPENDIX 6

*Percentage of total reported catch of shark species listed on Schedule 6 reported against each primary processed state for the 2006-07 fishing year<sup>42</sup>*

Primary Processed State	Description	Shark species listed on Schedule 6				
		Blue shark	Mako shark	Porbeagle shark	Rough skate	Smooth skate
DRE	Dressed	3.41%	30.56%	16.44%	2.35%	0.49%
FID	Dried fins	0.49%	0.28%	0.00%	0.00%	0.00%
FIL	Fillets: skin-on	0.00%	16.61%	0.00%	0.24%	1.51%
FIN	Fins	0.63%	0.72%	0.00%	0.16%	0.08%
FIW	Wet fins	90.41%	46.27%	66.39%	0.00%	0.00%
GRE*	Green (or whole)	4.76%	3.93%	11.97%	10.60%	25.73%
GUT	Gutted	0.00%	0.15%	0.03%	0.14%	0.00%
HGU	Headed and gutted	0.28%	0.80%	3.46%	0.11%	0.71%
MEA	Fish meal	0.01%	0.68%	1.71%	1.04%	2.63%
WRS	Skate or ray wings	0.00%	0.00%	0.00%	85.35%	68.85%

\* Includes sharks returned to the sea alive

<sup>42</sup> Reporting issues discussed in footnote 41 also apply here.

## APPENDIX 7

*Percentage of reported catch by primary processed state (2002-2007). \* <sup>43</sup>*

Common Name	DRE	DVC	FID	FIL	FIN	FIW	GRE	GUT	HGF	HGT	HGU	LIV	MEA	SKF	TRF	WRS
Amblyraja georgiana	---	---	---	---	---	---	4.54%	---	---	---	---	---	95.46%	---	---	---
Basking shark	3.22%	---	---	0.23%	94.63%	0.27%	0.96%	---	---	---	0.04%	---	0.04%	---	---	0.61%
Baxter's lantern dogfish	7.95%	---	---	---	---	---	22.56%	---	---	---	---	69.03%	0.46%	---	---	---
Bigeye thresher	---	---	---	68.50%	---	---	31.50%	---	---	---	---	---	---	---	---	---
Black ghost shark	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Blackbelly lantern shark	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Blue shark	10.86%	---	0.11%	0.04%	45.52%	41.46%	0.97%	0.03%	0.21%	0.04%	0.73%	---	0.03%	---	---	---
Bramble shark	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Broadnose sevengill shark	75.55%	0.04%	---	---	15.03%	---	2.87%	0.12%	---	---	5.67%	---	0.72%	---	---	---
Bronze whaler shark	48.41%	---	---	0.44%	15.04%	2.98%	6.03%	0.15%	0.15%	5.91%	20.59%	0.03%	0.26%	0.02%	---	---
Carpet shark	4.98%	---	---	---	89.67%	0.21%	5.11%	0.02%	---	---	---	---	0.01%	---	---	---
Cat shark	---	---	---	---	21.94%	---	78.06%	---	---	---	---	---	---	---	---	---
Chimaera spp.	---	---	---	---	---	---	0.83%	---	---	---	---	---	99.17%	---	---	---
Chimaera, purple	0.63%	---	---	---	---	---	52.89%	---	---	---	---	---	46.48%	---	---	---
Dawson's cat shark	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Deepsea skates	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Deepwater dogfish (Unspecified)	0.56%	---	---	---	---	---	10.24%	---	---	---	0.04%	52.21%	36.95%	---	---	---
Deepwater spiny skate	---	---	---	---	51.58%	---	1.88%	---	---	---	---	---	46.54%	---	---	---
Eagle ray	3.95%	---	---	68.93%	0.20%	---	11.90%	0.14%	---	---	0.02%	---	3.02%	---	---	11.85%
Eaton's skate	---	---	---	---	---	---	13.02%	---	---	---	---	---	86.98%	---	---	---
Electric ray	---	---	---	7.97%	---	---	3.58%	0.35%	---	---	---	---	88.10%	---	---	---
Elephant fish	8.15%	0.07%	---	0.06%	---	---	0.49%	89.47%	0.01%	0.01%	1.70%	---	0.02%	---	---	---
Etmopterus pusillus	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

<sup>43</sup> Reporting issues discussed in footnote 41 also apply here.



Common Name	DRE	DVC	FID	FIL	FIN	FIW	GRE	GUT	HGF	HGT	HGU	LIV	MEA	SKF	TRF	WRS
Etmopterus spp.	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Frill shark	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Ghost shark	80.95%	0.07%	---	0.09%	0.01%	---	4.69%	0.16%	---	0.06%	11.77%	---	2.11%	0.08%	---	---
Giant black ghost shark	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Hammerhead shark	58.52%	---	---	---	1.01%	---	7.87%	0.54%	0.41%	1.35%	30.30%	---	---	---	---	---
Leafscale gulper shark	0.14%	---	---	---	---	---	98.95%	---	---	---	---	---	0.91%	---	---	---
Little sleeper shark	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Longnose velvet dogfish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Long-nosed chimaera	17.06%	---	---	---	---	---	1.47%	---	---	---	1.75%	---	79.72%	---	---	---
Longnosed deepsea skate	---	---	---	---	---	---	61.63%	---	---	---	---	---	38.37%	---	---	---
Long-tailed skate	---	---	---	---	---	---	41.03%	---	---	---	---	---	58.97%	---	---	---
Lucifer dogfish	---	---	---	---	---	---	76.37%	---	---	---	---	---	23.63%	---	---	---
Mako shark	33.65%	---	0.08%	2.23%	35.07%	14.48%	8.95%	0.08%	3.12%	0.12%	2.06%	---	0.15%	0.01%	---	---
Manta ray	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Northern spiny dogfish	63.60%	---	---	0.03%	16.56%	---	11.65%	---	---	0.02%	6.74%	---	1.39%	---	---	---
Notoraja spinifera	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Oval electric ray	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Pacific sleeper shark	---	---	---	---	---	---	---	14.29%	---	---	85.71%	---	---	---	---	---
Pale ghost shark	94.18%	---	---	---	0.01%	---	1.03%	---	---	---	0.15%	0.01%	4.58%	0.04%	---	---
Pelagic stingray	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Plunket's shark	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Pointynose blue ghost shark	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Porbeagle shark	11.27%	---	---	0.21%	54.90%	29.16%	2.21%	0.04%	---	---	1.44%	---	0.77%	---	---	---
Potuguese dogfish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Prickly dogfish	6.46%	---	---	---	---	---	68.55%	---	---	---	---	---	24.99%	---	---	---
Prickly shark	99.80%	---	---	---	---	---	---	---	---	---	0.20%	---	---	---	---	---
Purple chimaera	61.26%	---	---	---	---	---	---	---	---	---	---	---	38.64%	0.05%	---	---
Rays	---	---	---	8.19%	---	---	3.26%	---	---	---	---	---	88.55%	---	---	---
Rig	81.27%	0.09%	---	0.09%	0.72%	---	4.25%	0.25%	0.06%	0.37%	12.87%	---	0.01%	0.02%	---	---
Rough shovelnose dogfish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Rough skate	5.10%	0.09%	---	66.59%	0.25%	---	7.66%	0.07%	---	0.01%	0.68%	---	1.17%	---	0.20%	18.18%
Roughskin dogfish	0.90%	---	---	---	---	---	99.10%	---	---	---	---	---	---	---	---	---
Sand shark	14.61%	---	---	---	---	---	74.23%	---	---	---	11.16%	---	---	---	---	---

Common Name	DRE	DVC	FID	FIL	FIN	FIW	GRE	GUT	HGF	HGT	HGU	LIV	MEA	SKF	TRF	WRS
School shark	87.24%	0.09%	---	0.47%	0.65%	---	1.18%	0.03%	0.15%	0.14%	9.48%	0.01%	0.06%	0.50%	---	---
Seal shark	56.18%	0.03%	---	0.02%	0.28%	---	1.28%	0.05%	0.01%	0.07%	5.41%	13.27%	23.40%	0.02%	---	---
Shark (Unspecified)	---	---	---	0.70%	2.11%	---	---	---	---	---	---	97.18%	---	---	---	---
Other sharks & dogfish	15.92%	0.01%	---	0.01%	9.17%	0.04%	0.09%	0.05%	---	0.25%	2.14%	39.76%	32.55%	---	---	---
Sharponose sevengill shark	34.01%	---	---	---	---	---	59.91%	1.97%	---	---	4.10%	---	---	---	---	---
Short-tailed black ray	---	---	---	7.72%	---	---	38.75%	---	---	---	---	---	52.79%	---	---	---
Shovelnose dogfish	64.87%	---	---	---	0.03%	---	8.89%	---	1.29%	0.01%	1.99%	11.95%	10.31%	0.66%	---	---
Sixgill shark	---	---	---	---	22.60%	---	---	---	---	---	---	---	77.40%	---	---	---
Skate, Other	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Skates	20.19%	0.39%	---	70.92%	0.59%	---	3.91%	0.03%	---	---	0.80%	---	3.05%	---	0.07%	---
Slender smooth-hound	45.22%	---	---	6.38%	---	---	6.57%	---	---	---	41.83%	---	---	---	---	---
Smooth skate	1.78%	0.06%	---	54.84%	0.20%	---	26.56%	0.04%	---	---	0.46%	---	2.68%	---	0.10%	13.30%
Smooth skin dogfish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Somniosus microcephalus	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Spiny dogfish	5.98%	0.01%	---	0.03%	9.96%	---	71.22%	1.32%	---	---	0.61%	---	10.85%	---	---	---
Stingray (Unspecified)	58.52%	9.10%	---	4.08%	---	---	20.67%	0.31%	---	---	2.67%	---	4.65%	---	---	---
Thresher shark	69.39%	---	---	2.90%	10.22%	2.28%	9.12%	0.35%	0.08%	0.32%	5.10%	---	0.26%	---	---	---
Tiger shark	---	---	---	---	99.43%	---	0.57%	---	---	---	---	---	---	---	---	---
Velvet dogfish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Whiptail ray	---	---	---	19.51%	---	---	35.26%	---	---	---	---	---	45.23%	---	---	---
White pointer shark	8.55%	---	---	---	16.25%	---	68.39%	---	---	6.81%	---	---	---	---	---	---
Widenosed chimaera	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
<b>Total</b>	<b>44.36%</b>	<b>0.06%</b>	<b>0.01%</b>	<b>9.70%</b>	<b>5.36%</b>	<b>1.98%</b>	<b>18.59%</b>	<b>6.40%</b>	<b>0.07%</b>	<b>0.08%</b>	<b>4.82%</b>	<b>1.09%</b>	<b>5.01%</b>	<b>0.11%</b>	<b>0.02%</b>	<b>2.32%</b>

\* Processed states with total landed greenweight across all species of less than 1000kg have been excluded.  
The SUR (surimi code) has been deleted

Where:

<b>Landed state code</b>	<b>Sole or principal landed state</b>
GRE	Green (or whole)
GUT	Gutted
HGU	Headed and gutted
HGF	Headed, gutted, and finned
DRE	Dressed
FIL	Fillets: skin-on
SKF	Fillets: skin-off
TRF	Fillets: skin-on trimmed
DVC	Dressed-V cut (stargazer)
MEA	Fish meal
FIN	Fins
LIV	Livers
HGT	Headed, gutted, and tailed
FID	Dried fins
FIW	Wet fins
WRS	Skate or ray wings

## APPENDIX 8

*Reported shark catch in greenweight kgs by species landed with fin as primary processed state (2002-2007)*

Common name	FID	FIN	FIW	Greenweight finned	Percentage of total greenweight taken that is landed with fin as primary processed state
Blue shark	4237	1686200	1535915	3226352	82.29%
Spiny dogfish		1854501		1854501	4.30%
Mako shark	509	227452	93941	321901	47.39%
Porbeagle shark		184094	97757	281851	68.53%
Carpet shark		181271	420	181691	25.00%
Basking shark		153943	447	154390	29.37%
Other sharks & dogfish		122370	534	122904	2.95%
School shark		103997	0	103997	0.65%
Northern spiny dogfish		53029		53029	11.26%
Rig		51211		51211	0.72%
Thresher shark		20369	4542	24911	8.94%
Bronze whaler shark		14682	2910	17592	16.40%
Seal shark		6032		6032	0.18%
Broadnose sevengill shark		3194		3194	12.73%
Ghost shark		1335		1335	0.01%
White pointer shark		840		840	10.49%
Hammerhead shark		431		431	0.96%
Tiger shark		416		416	99.43%
Pale ghost shark		400		400	0.01%
Shovelnose dogfish		174		174	0.01%
Cat shark		76		76	0.59%
Sixgill shark		44		44	2.50%
Shark (Unspecified)		30		30	1.94%
Elephant fish		20		20	0.00%

## APPENDIX 9

### Percentage of reported shark catch by fishery (2002-2007)

Common name	BLL by vessels <28m	BLL by vessels 28m or over	Danish Seine	Deepwater/middle depth trawl	Domestic tuna SLL	Domestic tuna Troll	Foreign chartered tuna SLL	Inshore trawl	Potting	Purse seine	Set net
Blue shark	0.41%	0.21%	0.00%	0.85%	92.73%	0.20%	4.52%	0.93%	0.00%	0.00%	0.15%
Spiny dogfish	0.50%	8.62%	0.04%	27.98%	0.00%	0.00%	0.00%	55.80%	0.00%	0.00%	7.05%
Mako shark	4.03%	0.24%	0.00%	10.82%	67.88%	1.09%	11.06%	3.14%	0.00%	0.06%	1.67%
Porbeagle shark	0.38%	0.74%	0.00%	65.64%	12.36%	0.00%	3.79%	16.12%	0.00%	0.00%	0.96%
Carpet shark	2.37%	1.34%	0.09%	1.13%	0.00%	0.00%	0.00%	54.34%	3.79%	0.00%	36.94%
Basking shark	0.00%	0.00%	0.00%	89.19%	0.00%	0.00%	0.00%	10.80%	0.00%	0.00%	0.01%
Other sharks & dogfish	4.04%	10.02%	0.01%	76.57%	0.09%	0.01%	0.01%	5.94%	0.26%	0.00%	3.06%
School shark	22.84%	2.90%	0.10%	1.13%	0.02%	0.00%	0.05%	17.81%	0.07%	0.00%	55.09%
Northern spiny dogfish	28.57%	1.99%	0.02%	3.75%	0.00%	0.00%	0.00%	3.67%	0.00%	0.00%	61.99%
Rig	0.63%	0.04%	1.35%	1.35%	0.00%	0.00%	0.00%	16.08%	0.00%	0.00%	80.56%
Thresher shark	0.31%	0.03%	0.27%	28.51%	19.58%	0.13%	15.85%	20.22%	0.00%	0.00%	15.10%
Bronze whaler shark	7.95%	0.00%	0.17%	2.84%	9.57%	0.00%	0.02%	4.43%	0.00%	0.00%	75.01%
Seal shark	6.58%	3.36%	0.00%	50.23%	0.01%	0.00%	0.00%	0.64%	0.00%	0.00%	39.18%
Broadnose sevengill shark	9.16%	4.93%	0.00%	8.38%	0.00%	0.00%	0.00%	17.80%	5.90%	0.00%	53.84%
Ghost shark	0.06%	1.55%	0.05%	25.16%	0.00%	0.00%	0.00%	72.25%	0.00%	0.00%	0.93%
White pointer shark	1.66%	0.00%	0.00%	17.47%	0.00%	0.00%	0.00%	19.97%	0.00%	0.00%	60.90%
Hammerhead shark	5.07%	0.00%	2.03%	0.14%	1.10%	0.00%	0.00%	62.92%	0.05%	0.00%	28.70%
Tiger shark	0.00%	0.00%	0.00%	0.00%	53.85%	0.00%	46.15%	0.00%	0.00%	0.00%	0.00%
Pale ghost shark	0.03%	3.58%	0.00%	93.75%	0.00%	0.00%	0.00%	2.61%	0.00%	0.00%	0.03%
Shovelnose dogfish	5.63%	26.03%	0.00%	66.59%	0.05%	0.00%	0.01%	0.94%	0.00%	0.00%	0.75%
Cat shark	0.00%	0.00%	0.00%	92.42%	0.00%	0.00%	0.00%	7.58%	0.00%	0.00%	0.00%
Sixgill shark	4.76%	0.00%	0.00%	95.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Shark (Unspecified)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%
Elephant fish	0.02%	0.00%	1.26%	0.05%	0.00%	0.00%	0.00%	82.11%	0.00%	0.00%	16.56%
<b>Percentage by fishery</b>	<b>3.80%</b>	<b>5.87%</b>	<b>0.31%</b>	<b>25.17%</b>	<b>0.92%</b>	<b>0.01%</b>	<b>0.09%</b>	<b>45.44%</b>	<b>0.03%</b>	<b>0.00%</b>	<b>18.36%</b>

## APPENDIX 10

### *Processed weight (kg) of secondary processed state of landed sharks (2002-2007)*

Common Name	Secondary Processed State											
	DSB	FIT	FLP	GBP	HDS	LIB	LUG	ROE	SHF	WIN	WSB	Total
<b>Basking shark</b>						4781						4781
<b>Blue shark</b>	5					30			14152		1146	15333
<b>Broadnose sevengill shark</b>			8			15			927			950
<b>Bronze whaler shark</b>					30				1932			1962
<b>Carpet shark</b>									97			97
<b>Elephant fish</b>					1			45	991			1037
<b>Ghost shark</b>			20	0	5213	4			39340			44577
<b>Hammerhead shark</b>									2174			2174
<b>Mako shark</b>	1							1	91769		386	92156
<b>Northern spiny dogfish</b>									13197		0	13197
<b>Pale ghost shark</b>				1					832			833
<b>Porbeagle shark</b>			3					41	547		32	623
<b>Rig</b>		44	23266	0	65		199	10	101971			125556
<b>Rough skate</b>				0		493						493
<b>School shark</b>		25	114866		90				310449		0	425430
<b>Seal shark</b>		104				87098			2107			89308
<b>Other sharks and dogfish</b>		30				65			1413			1508
<b>Shovelnose dogfish</b>				0		3646						3646
<b>Smooth skate</b>			20	1								21
<b>Spiny dogfish</b>		8601	330	0	15				28333			37279
<b>Thresher shark</b>									3820			3820
<b>White pointer shark</b>									65			65
<b>Total</b>	6	8803	138513	2	5414	96132	199	97	614114	0	1564	864844

Where:

<b>Secondary Processed State</b>	<b>Description</b>
<b>DSB</b>	Dry shark fins by-product
<b>FIT</b>	Fish tails
<b>FLP</b>	Flaps
<b>GBP</b>	Gut by-product
<b>HDS</b>	Heads
<b>LIB</b>	Livers by-product
<b>LUG</b>	Lugs or collars
<b>ROE</b>	Roe
<b>SHF</b>	Shark fins
<b>WIN</b>	Wings
<b>WSB</b>	Wet shark fins by-product

## APPENDIX 11

### *Observer coverage and reported shark catch for the period 1 January 2002 to 31 December 2006*

<b>Fishery</b>	<b>Total number of days fished</b>	<b>Total number of fishing days observed</b>	<b>Percentage observer coverage</b>	<b>Total reported shark catch (greenweight t)</b>	<b>Total unobserved reported shark catch (greenweight t) **</b>
Inshore trawl	145,851	2,733	1.9 %	37176	36470
Deepwater/middle depth trawl	76,448	7,376	9.6 %	20595	18618
Set net	123,660	148	0.1 %	15026	15011
BLL by vessels 28m or over	4,680	1,098	23.5 %	4800	3672
Bottom longline by vessels less than 28m	57,181	534	0.9 %	3113	3085
Domestic tuna surface longline	23,495	393	1.7 %	753	740
Danish Seine	7,219	0	0.0 %	250	250
Potting (excl Eels)	160,618	0	0.0 %	26	26
Domestic tuna troll*	33,022	10	0.0 %	4	4
Purse seine	3,605	107	3.0 %	1	1
Foreign chartered tuna surface longline	1,439	1,548	107.6 %	75	0

\* Observer coverage only started in this fishery in the 2006/07 fishing year

\*\* Assuming reported shark catch evenly distributed across days fished



## APPENDIX 12

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### *Notes on data used to derive the tables shown in the appendices*

The following notes relate to the data;

- Data comes from the landing section of the commercial fishing returns.
- Data was restricted to landings of species class **F** - Fish, species sub classes **S** (sharks and dogfish), **R** (rays and skates) and **C** (chimaeras).
- Any weights recorded as retained, held in holding pots in the sea or on land, transhipped to a New Zealand registered vessel, were excluded to avoid double counting.
- The fishing year is the standard fin-fishing year which runs from October to September.
- The total greenweight will include any ET (extra territorial) landings reported to the Ministry on the returns.
- The Ministry has prepared these tables on the basis of information provided to it in returns provided by fishers. The Ministry does not accept responsibility for the completeness or accuracy of the information used

## APPENDIX 13

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### *Code of practice for safe handling, processing and unloading of sharks – Tuna NZ July 2001*

#### *Processing*

*ALWAYS KILL THE SHARK HUMANELY BEFORE PROCESSING.*

a) Guideline

Cut through the backbone behind the head and then behind the dorsal fin

b) Be selective in the take of sharks

An optimum size. Take sharks that are about the average size for their species, neither the huge ones or small ones.

Not every shark hooked needs be landed – decide if the shark is small enough to handle (ie) remove the hook humanely and release alive. If very large and unable to be processed, release by hauling in as close as able to safely cut the nylon.

NO Shark to be released with any nylon wrapped around it

#### **Use of wire traces including lures.**

It has been recognised that the use of wire traces may prevent sharks from chewing through an equivalent nylon trace. As wire traces have been suggested as a mitigation measure for overcoming seabird bycatch, more consideration and consultation is needed before a recommendation is put forward

#### **Recording, Unload and Sale of Shark**

Shark and shark fins are to be reported in the same manner as other fish and kept separate in their respective species.

They must be recorded in the Catch Effort as well as the Catch Landing Returns. Upon unloading to an LFR (be it a specialised shark fin LFR), a proper invoice **MUST** be exchanged, this is a record that they have been legally discharged and should state the quantity of shark fins discharged (by species). Money exchanged should be equal to that on the invoice and should be in the form of a cheque.

The purpose of exchanging fish for an invoice is to prevent black market fish sales. If there is no invoice exchanged it appears it is considered as black market sales of fish.

## **Safety considerations when Handling Sharks**

Guidelines should be agreed amongst skipper and crew about the level of experience needed to land and process shark. This should include discussion about the size of sharks able to be landed safely, the technique for bringing them onboard including gaffing, who will be involved and who will be using the knife.

There is no place for complacency or inattention, gumboots and gloves should be worn at all times.

Emergency First Aid should be known and understood, the First Aid kit should be well stocked with bandages and pain relief in the event of an accident whilst processing sharks including knife wounds and shark bite.

Sharks should be killed humanely and where safety is not compromised nylon should be removed from sharks if they are entangled in nylon.

## **Precautionary Levels of Take**

There is no agreement about an acceptable level or take of sharks. To continue any level and activity of extracting fish, consideration must be given to associated and dependant species. Continuing fishing activities must consider a sustainable level of shark take alongside the activity of targeting tuna species. Fishers should be aware of and remain informed about the development of the International Plan of Action for the Management of Sharks and participate in the development of New Zealand's management strategy.

## **Improved data requirements**

Objectives and guidelines need to be established as proposed in the FAO International Plan of Action for the Conservation and Management of Sharks.

### *Footnote*

*This document was developed from discussions, meetings and research over a period of two years. Note this is a draft document and your comments, additions and criticisms are welcomed. Please contact your Tuna NZ committee rep or this office.*

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